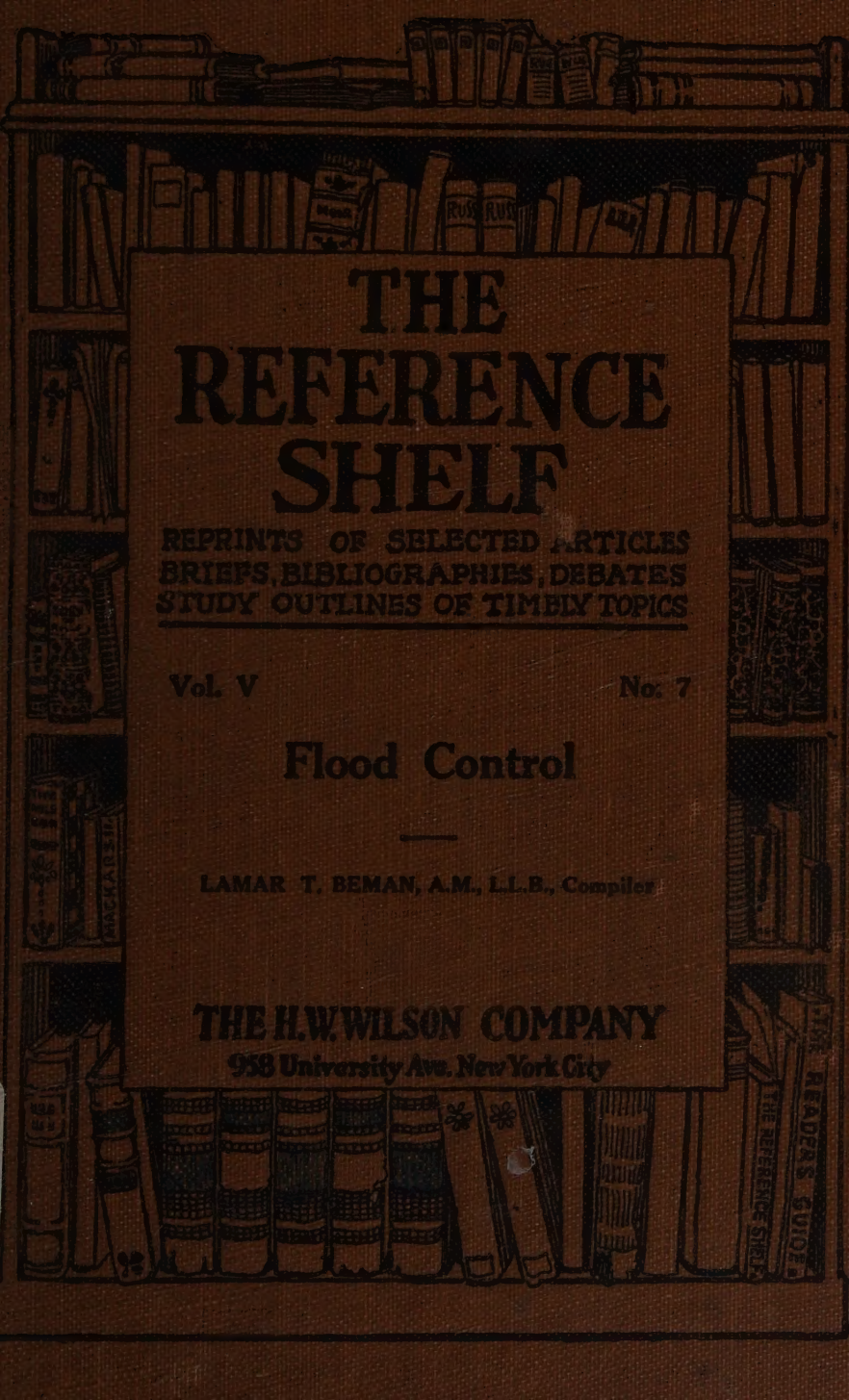




THE REFERENCE SHELF

REPRINTS OF SELECTED ARTICLES
BRIEFS, BIBLIOGRAPHIES, DEBATES
STUDY OUTLINES OF TIMELY TOPICS

Vol. V

No. 7

Flood Control

LAMAR T. BEMAN, A.M., LL.B., Compiler

THE H.W. WILSON COMPANY

958 University Ave. New York City



WITHDRAWN

COLLEGE
OF THE PACIFIC

The Reference Shelf

is published to make available when needed good debates, collections of articles, briefs, bibliographies and study outlines, on timely subjects for public discussion. Each number is devoted to a single subject. To make the material available at the time of greatest need, publication is irregular. Each volume contains ten or more separate issues, about 1,000 pages in all, and covers about a year in time.

VOLUME I. *Contents*

Single copies, 75c unless otherwise noted; 8 copies, ordered at one time, \$4.

- No. 1. Cancellation of Allied Debt (Debate, briefs, references and reprints). Johnsen, J. E.
 - No. 2. China and Japan (Study outline). Johnsen, J. E. 50c.
 - No. 4. *Kansas Court of Industrial Relations. Johnsen, J. E.
 - No. 5. *Towner-Sterling Bill (U. S. Department of Education). Beman, L. T.
 - No. 6. *Cabinet Form of Government. Ettrude, D. J.
 - No. 7. *Enforcement of the Decisions of the Railway Labor Board. Beman, L. T.
 - No. 8. *Ship Subsidies. Beman, L. T.
 - No. 10. *Ku Klux Klan. Johnsen, J. E.
- Nos. 3, 9 and 11 are out of print.

VOLUME II. *Contents*

Subscription price per volume of 8 numbers, \$4.80.

Single numbers, 90c.

- No. 2. *Permanent Court of International Justice. Johnsen, J. E.
 - No. 3. *League of Nations. Johnsen, J. E.
 - No. 4. French Occupation of the Ruhr (Oxford-Bates debate, with briefs, references, reprints).
 - No. 5. *Restriction of Immigration. Phelps, E. M.
 - No. 7. *Soldiers' Bonus. Johnsen, J. E.
 - No. 8. Power of Congress to Nullify Supreme Court Decisions (References, reprints). Ettrude, D. J.
 - No. 9. *Superpower. Beman, L. T.
 - No. 10. *Recognition of Soviet Russia. Hodgson, J. G.
- Nos. 1 and 6 are out of print.

* Contains briefs, references and reprints of selected articles.

The Reference Shelf

Subscription for Volumes III, IV and V (10 issues each), \$6.00.

Single numbers 90c unless otherwise noted.

VOLUME III. Contents

- No. 1. *Tax-Exempt Securities. Beman, L. T.
- No. 2. *A Labor Party for the United States. Hodgson, J. G.
- No. 3. *Single Six-Year Term for President. Phelps, E. M.
- No. 4. *Japanese Exclusion. Johnsen, J. E.
- No. 5. *Proportional Representation. Beman, L. T.
- No. 6. *Academic Freedom. Johnsen, J. E.
- No. 7. *Abolishment of Electoral College. Beman, L. T.
- No. 8. *Metric System. Johnsen, J. E.
- No. 9. *Child Labor. Johnsen, J. E.
- No. 10. *Outlawing the Pistol. Beman, L. T.

VOLUME IV. Contents

- No. 1. Government Regulation of the Coal Industry. Johnsen, J. E.
(Supplementary to Handbook Government Ownership of Coal Mines).
- No. 2. *Election vs. Appointment of Judges. Beman, L. T.
- No. 3. *Military Training Compulsory in Schools and Colleges.
Beman, L. T.
- No. 4. *St. Lawrence River Ship Canal (Supplement to Vol. 1, No. 3). Johnsen, J. E.
- No. 5. *Federal Department of Education (Supplement to Towner-Sterling Bill, Vol. 1, No. 5). Johnsen, J. E.
- No. 6. *The Direct Primary. Beman, L. T.
- No. 7. *Special Legislation for Women. Johnsen, J. E.
- No. 8. *Farm Relief. Beman, L. T. \$1.25
- No. 9. *Civil Liberty. Phelps, E. M. \$1.25
- No. 10. Questions of the Hour (Study Outline). Johnsen, J. E. New edition.

VOLUME V. Contents

- No. 1. *Prohibition (Supplement to Handbook). Beman, L. T.
- No. 2. *Religious Teaching in the Public Schools. Beman, L. T.
- No. 3. *Independence for the Philippines. Ball, E.
- No. 4. *Agriculture and the Tariff. Johnsen, J. E.
- No. 5. *Five Day Week. Beman, L. T.
- No. 6. *Jury System. Johnsen, J. E.
- No. 7. *Flood Control. Beman, L. T.

Future Issues to be Announced

Articles supplementing the material published in the numbers of the Reference Shelf will be found on reference to the Readers' Guide to Periodical Literature.

College of the Pacific
Stockton, Calif.

THE REFERENCE SHELF

Volume V

Number 7

FLOOD CONTROL

COMPILED BY
LAMAR T. BEMAN, A.M., LL.B.
Attorney at Law, Cleveland, O.



NEW YORK
THE H. W. WILSON COMPANY
1928

College of the Pacific
Stockton, Calif.

TC
425
M6B4

Published June 1928
Printed in the United States of America

10/10
Hester 6 Aug. 1934

^{2 1 3 4 3} INTRODUCTION

Ever since civilized men first explored the Mississippi valley that river has been subject to great floods. Almost every year there is a flood that puts the river out of its banks, and every five or six years there is a great and destructive flood. There is a record of a great flood on the Mississippi four hundred years ago. Two of the greatest floods occurred in 1785 and 1844, but the flood of 1927 was the most destructive of all. Then the water rose two or three feet above any previous record all the way from Cairo to the gulf, a distance of over a thousand miles. The levees broke in two hundred and twenty-six different places and inundated more than twenty thousand square miles of land, parts of seven states. The property damage was estimated at \$236,000,000. It has been declared the greatest peace time disaster in our history.

Until recently it was often said and quite generally believed that deforestation was the cause of floods. Even still one hears or reads this statement, made as a positive and definite fact, as, for example, in the *Chicago Tribune* on September 25, 1927. The evidence now seems clear that deforestation has had little or nothing to do with floods.

Flood control, it is now generally agreed, is a matter of engineering. To prevent floods on the lower Mississippi it is necessary to build extensive and expensive engineering works. The army engineers have estimated that to make the river safe it will cost \$296,400,000 in addition to the cost of land for right of way and the claims for damages. They recommend that the federal government pay \$258,960,000 while the seven

states and their local governments pay \$37,440,000, provide the land for the right of way and assume all claims for damages.

The chief difference of opinion on the subject of flood control on the lower Mississippi is as to who shall pay the cost. The above recommendation of the army engineers is approved by President Coolidge and by the Mississippi River Commission. On the other hand, practically all of the congressmen and other leaders from the states that were flooded demand that the federal government assume entire responsibility for flood control on the lower Mississippi and pay the entire cost. This position has also been taken by the Chamber of Commerce of the United States which submitted the question as a referendum to all its members. Several of the leaders of the American Federation of Labor have also expressed the same idea.

So far comparatively little has been said against federal control. The dangers and possible consequences of such a complete change of policy have not been adequately discussed by the statesmen and other leaders of thought who are usually quick to warn of the increasing powers and influence of the federal government and the declining importance of the states. Perhaps we see illustrated again the old custom mentioned in an editorial in the *New York Times* on January 28, 1926: "States rights is good to make speeches about; pretty sure to be thrown away when the vote comes."

LAMAR T. BEMAN

March 28, 1928

CONTENTS

	PAGE
INTRODUCTION	3
BRIEFS	
Introduction	7
Affirmative	8
Negative	15
BIBLIOGRAPHY	
Bibliographies	27
General References	27
Affirmative References	37
Negative References	39
GENERAL DISCUSSION	
Morgan, Arthur E. The Tools for Flood Control.World's Work	41
A Mississippi Flood 400 Years Ago.....Literary Digest	45
The Flood Record	47
Damages Caused by Flood of 1927.....Congressional Record	54
Reforestation Not a Remedy	57
Jadwin, Edgar. Reforestation Not a Flood Control Project	62
Leavitt, Scott. A Forester's View	
.....Congressional Record	65
Flood Control in Congress.....Literary Digest	72
Brief Excerpts	76

AFFIRMATIVE DISCUSSION

The Nation's Problem	87
Reid, Frank R. The Nation's Drainage.....	97
Collier, James W. Control Should Be Vested in the Federal Government.....	Congressional Record 104
Brief Excerpts	119

NEGATIVE DISCUSSION

Local Financial Cooperation Essential.....	127
Jadwin, Edgar. A Reasonable Burden.....	131
Big Scale Log Rolling.....	Cleveland Plain Dealer 133
Arguments in the Negative.....	135
Brief Excerpts	152

BRIEFS

RESOLVED: *That the federal government should assume the entire responsibility for the flood control of the lower Mississippi and should pay the entire cost.*

INTRODUCTION

I. The meaning of the question

- A. The lower Mississippi means the Mississippi river from the point where the Missouri river meets it to the Gulf of Mexico.
- ✓ B. Flood control includes making the surveys and plans, and constructing all the works to carry them out, including levees, spillways, revetment, drainage, dredging, weirs, bridges, dams, reforestation and anything else necessary to make the alluvial valley safe and secure from future floods.

II. The importance of the question

- A. There have been floods on the lower Mississippi almost every year.
- B. For the past fifty years there has been joint action by the federal government and the states immediately concerned, or their political subdivisions.
- C. In spite of years of planning and work, the annual losses from floods are still great while the loss and damage wrought by the flood of 1927 was a great national calamity.

AFFIRMATIVE

- I. There is urgent necessity for the federal government to take entire charge of the flood prevention work on the lower Mississippi and to pay its entire cost.
 - A. Flood control on the lower Mississippi has been a baffling and unsolved problem ever since civilized men first went there.
 1. There have been great floods on the lower Mississippi from our earliest knowledge of the river.
 - a. There is a record of a great flood four hundred years ago. (*Literary Digest*. 94:22. July 30, 1927).
 - b. Two of the greatest floods were in 1785 and 1844. (*Engineering News*. 69:916. May 1, 1913).
 2. Floods on the lower Mississippi are frequent and continual.
 - a. There is a flood almost every year.
 - b. There is a great and destructive flood every five or six years.
 - B. The damage and losses from floods have been very great.
 1. The total losses have run into hundreds of millions.
 - a. There are no complete records of these losses.
 - b. In the last twenty-five years the losses have exceeded \$400,000,000.
 2. The damage, destruction and loss in the flood of 1927 were greater than in any previous flood.
 - a. About one hundred and eighty-three human lives were lost.

- b. Over seven hundred thousand people were made homeless.
 - c. More than twenty thousand square miles were flooded.
 - d. Four and a half million acres of cultivated land were flooded, only about a third of which were replanted in 1927.
 - e. A large amount of live stock was lost.
 - f. The total property loss was about \$236,000,000.
 - g. This loss was sustained in one hundred and seventy-four different counties, parts of seven different states.
 - h. It was the greatest peace time disaster in our entire history.
- C. Divided responsibility has failed to control the floods of the lower Mississippi.
- 1. Divided responsibility in administrative work has almost always been a failure.
 - a. President Roosevelt emphasized this fact after Congress had directed him to appoint a commission to construct the Panama canal. (*Theodore Roosevelt. An Autobiography.* p. 528).
 - b. This is why the old board plan of city government and the newer commission plan of city government were both failures.
 - 2. The federal government has not borne its share of the cost in the past.
 - a. Since 1882, when the federal government began to share in the cost of the work, a little over \$238,000,000 has been spent on flood control, of which

the federal government has contributed only a little over \$71,000,000, or about 30 per cent. (*Report of General Jadwin*. 1927. p. 10).

- D. Flood control on the lower Mississippi is a national problem.
1. President Coolidge said in his message to Congress on December 6, 1927: "Flood control is clearly a national problem."
 2. A vast territory is drained by the water that goes down the Mississippi river.
 - a. It includes the drainage from all or part of thirty-one states and two provinces of Canada.
 - b. The Mississippi drains more than 40 per cent of the area of the United States.
 3. The floods of the Mississippi have been made worse by the progress of civilization.
 - a. The Chicago drainage canal diverts much more water from the Great lakes down the Mississippi river than was ever authorized by the federal government.
 - b. One small river in Indiana has been diverted so that its water flows down the Mississippi instead of into the Great lakes, as it naturally did.
 - c. Deforestation has made floods worse, raising the level of the water because of the silt and detritus that the water carries in greater amount. (*House Hearings*. 1927. p. 896 et seq.).
 - d. The digging of ditches to drain swamps has made the runoff flow quicker into the river.

- e. Tilling of farm land has had the same effect.
- 4. It is too great an undertaking for any state or group of states to handle successfully.
 - a. This is the statement of all the congressmen and other leaders from the lower Mississippi.
- E. Only the federal government can make the lower Mississippi safe for all time.
 - 1. The losses in the flood of 1927 paralyzed the whole district.
 - a. The flood of 1927 was the worst in the history of this flood-tormented district.
 - (1) The water from Cairo to the gulf was two or three feet above any other record.
 - b. This agricultural district of about thirty thousand square miles, which has spent \$292,000,000 to prevent floods, which lost \$236,000,000 in the flood of 1927 and as much more in the floods of the past generation, is unable to do more.
 - (1) Most of the people are in debt, most of the property is mortgaged.
 - (2) Many of the flood districts are insolvent or bankrupt. (Statement of Frank R. Reid. *House Committee Document* no. 7. December 21, 1927. p. 7).
 - 2. When the state governments fail, Americans always turn to the federal government at Washington.

- a. This has been true throughout the whole history of the United States.
 - b. It explains the constantly growing powers and duties of the federal government, and the constantly decreasing powers and importance of the states.
 3. All necessary tasks that are too big for the states must be handled by the federal government.
 - a. Flood control of the lower Mississippi is a bigger job than the building of the Panama canal.
- II. To turn over to the federal government entire responsibility for flood prevention and control of the lower Mississippi and to have the federal government pay the entire cost of the same is a wise and desirable policy.
- A. It will solve the problem of flood control on the lower Mississippi for all time.
 1. It will recognize the matter of flood control on the Mississippi from Cairo to the gulf as one problem.
 - a. Past failures in the efforts at flood control have been due largely to the fact that this one task of building levees along both sides of a thousand miles of meandering river has been managed by a great number of boards in separate levee districts.
 - b. In the flood of 1927 the levees broke in two hundred and twenty-six places, the weak places, the natural result of having one job managed by a great many different boards.
 2. It will recognize it as a national problem.

- a. Management will be vested entirely in the Mississippi River Commission.
 - b. Ultimately it will be under the direction of a single executive head, a Secretary of Flood Control.
 - c. As soon as the federal government assumes full responsibility for flood control, it will be handled as one administrative problem.
- B. It will bring peace and security to the cities and the farms, to the people and the industries in the alluvial valley of the Mississippi.
- 1. The people in this region have lived all of their lives in fear of being drowned or of being driven from their homes and leaving all of their property to be destroyed or damaged.
 - a. Expenditures for such a purpose will be in the nature of insurance.
 - 2. It will make possible the reconstruction and restoration of the district, which includes the most fertile land in this country.
 - a. All fear of floods because of weak links in the levees will be removed.
- C. It will be a lasting benefit to the whole country.
- 1. It will be a profitable national investment.
 - a. It will save the American people enormous losses.
 - b. It will more than pay for itself in a few years.
 - 2. It will make secure lands that are a great national asset.
 - a. They grow the best quality of cotton raised in this country.
 - b. They are the only part of the country where sugar cane can be raised.

- c. They produce the largest crops of any cultivated land in America.

III. For the federal government to assume full responsibility for the prevention and control of floods of the lower Mississippi, and to pay the entire cost of the same, is a practicable remedy for this century old and annoying problem.

A. The federal government can do big things.

1. It has the necessary resources.

a. Expenditures entirely beyond the possibility of the levee districts or even the states of the lower Mississippi are a relatively small matter to the federal government.

2. It has done big things in the past.

a. It built the Panama canal.

b. It brought the World war to a speedy close.

3. It brings to a great task unified and harmonious action and management.

a. It started to build the Panama canal under the direction of a commission, but soon put the work under a single administrative head.

B. It will strengthen and improve the federal government itself.

1. Our Constitution did not originally give to the federal government adequate powers.

a. The Constitution was framed in the eighteenth century when travel was slow and difficult, when the states were chiefly large patches of woods, and when the thirteen states were jealous of their rights and of each other.

- b. In all the other federal governments in the world more powers are given to the central government than is the case in this country.
- 2. The powers of our federal government have grown and developed with the years and with necessity.
 - a. Its powers have been slowly and continually increased by formal amendment to the Constitution, by judicial interpretation, by legislative and executive construction and by the necessities of modern conditions of life.
- 3. This further extension of the powers of the federal government would be a lasting benefit to the whole country.
 - a. It is in accordance with the spirit of the age, the logical next step.
 - b. All of the states immediately concerned frankly acknowledge their own impotence and approve of this step.
- C. It is endorsed by the best minds.
 - 1. It has been endorsed by the great majority of the witnesses that have appeared before the congressional committees.
 - 2. It has been approved by the Chamber of Commerce of the United States.
 - 3. The leaders of the American Federation of Labor approve it.
 - 4. All of the congressmen from the states of the lower Mississippi are in favor of it.

NEGATIVE

- I. It is unnecessary for the federal government to pay the entire cost of flood prevention on the lower Mississippi.

- A. The states can help, paying at least 20 per cent of the cost.
1. A small section of land is to be tremendously benefited by an enormous outlay.
 - a. It is neither right nor fair for the taxpayers of the whole country to bear all the expense when all of the benefit accrues to a small strip of land.
 2. The land to be so benefited is very rich and fertile soil.
 - a. It is the most rich and fertile part of the United States.
 - b. It yields far larger and better crops than the farms occupied by the great majority of American farmers, many of whom are now in a desperate struggle to make a living by farming and ought not to be called upon to pay higher taxes.
 3. In all past undertakings by the federal government for the benefit of a particular section of the country, the section so benefited has paid at least half of the cost.
 - a. This has always been the rule in the federal aid work of the national government.
 4. For much of the land benefited, this flood control work is a reclamation project.
 - a. Much of it was originally swamp land that was flooded every year, and was farmed only by reclamation works that kept the river out.
 - b. Most of it was originally useless for agricultural or residence purposes because of its being flooded every year.

5. In all reclamation projects by the federal government it has always been the custom to have the lands benefited pay the entire cost.
- B. Flood control of the lower Mississippi is not a national problem.
 1. Rainfall is greater in the South.
 - a. The flood of 1927 was due largely to heavy southern rains.
 2. There have been great and destructive floods in almost every part of the country, many of them entailing far greater loss of life than the flood of the Mississippi in 1927. (*Harper's Encyclopaedia of United States History*. vol. 5, p. 76-9).
 - a. Many of these floods are caused by rains that fall in other states, for example, the floods on the Ohio river all the way from Wheeling to Cincinnati and beyond are caused by rains in Pennsylvania and New York states.
 - b. There have been destructive floods in New England and in California, on the Colorado river and on the Columbia river.
 3. Flood prevention and flood control has always been recognized as a matter for state or local action.
 - a. In 1900 a tidal wave swept the city of Galveston doing great damage and killing forty times as many people as lost their lives in the 1927 flood of the lower Mississippi, but the city repaired its damage and built a tidal wall to protect itself for the future.

- b. In 1913 heavy and continuous rains caused a great flood at Dayton, Ohio, with the loss of eighty-four lives and a property damage of \$130,000,000, but instead of appealing to Washington, Dayton at very great cost built a series of dry dams to hold back flood waters in the future and make itself and the whole Miami valley safe for all time.
- c. Hundreds of similar instances can be given, and in many of them the per capita cost was greater than a 20 per cent share would be to the people in the alluvial valley of the Mississippi river.
- C. The federal government has already done much to prevent floods in the lower Mississippi valley.
 - 1. In 1879, almost fifty years ago, it created the Mississippi River Commission.
 - 2. In 1850 Congress gave the three states of Louisiana, Arkansas and Mississippi more than twenty million acres of public land, which is more than thirty-two thousand square miles, "to enable the several states to construct the necessary levees and drains to reclaim the swamp and overflow lands therein."
 - 3. The federal government has spent over \$71,000,000 out of the national treasury to prevent floods on the lower Mississippi, while other sections of the country have paid for their own flood prevention work.
 - 4. There is nothing new about floods on the lower Mississippi except the high powered

propaganda and agitation of the pork barrel politicians of the district.

- a. There was a great flood on the Mississippi river four hundred years ago. (*Engineering News-Record*. 98:851. May 26, 1927).
- b. There were great floods on the lower Mississippi in 1785 and in 1844.
- c. Deforestation has had absolutely nothing at all to do with floods, and is not even a partial cause of floods.
- d. The Chicago water steal is not more than a drop in the bucket.

II. It is unwise and undesirable that the federal government should pay the entire cost of flood prevention on the lower Mississippi.

A. If paid for entirely by the federal government, the cost will be enormous.

1. The immediate cost, the outlay during the next decade, will be about a billion dollars.

a. The estimates of the army engineers call for an expenditure of \$296,000,000.

(1) They estimate flood control works will cost \$185,400,000.

(2) They allow \$110,000,000 for channel stabilization and mapping.

b. Other expenses, necessary for the federal government to pay, would increase the estimate several fold.

(1) There would be a great outlay for the land, the right of way.

(2) Drainage works would have to be built at considerable expense.

- (3) There would be unreasonable claims presented for damages.
 - (4) The damages done by subsequent floods would have to be repaired.
- 2. The state and local governments will make unreasonable demands.
 - a. Having got into the pork barrel, there would be no limit to their greed.
 - b. They will demand unnecessary improvements and outlay.
 - c. Unreasonable damage claims will continually be presented.
 - d. They will insist upon the federal government buying from the states or local districts the flood works already constructed; upon being paid back what they have spent for levees and other flood prevention works.
 - (1) This demand has already been made upon Congress in vigorous and extravagant language by spokesmen of the district. (*See testimony of one Joe H. Moore. House Hearings. 1927. p. 1023.*)
 - (2) But the federal government has already paid for the flood prevention works, by giving the states more than twenty million acres of public land.
 - e. The federal government would be fleeced and robbed at every turn.
 - (1) Some of the southern politicians seem to be so hungry that they can't wait till the pork barrel is opened.

3. The ultimate cost to the federal government will run way into the billions.
 - a. The federal government would be committed to the policy of paying for flood prevention and control for the benefit of a small section of the country.
 - (1) If the federal government should agree to undertake full responsibility and to pay the full cost for flood control in one small section of the country, then every other section would rightfully demand the same consideration.
 - b. Ultimately the federal government would have to do all the flood control and flood prevention work in the country.
 - (1) The people living along the tributaries of the Mississippi, the Missouri, the Ohio, the Arkansas and the Red would probably be the first to present their claims.
 - (2) There are flood control works in almost every state in the union, and every state needs more and better construction.
 - (3) There are two hundred and seventy-five navigable rivers in this country.
 - c. Every state and every locality would want the federal government to repay it for what it has spent for flood control and flood prevention.

THE REFERENCE SHELF

- (1) The tributaries of the Mississippi and hundreds of other rivers, the cities of Dayton and Galveston and thousands of other cities and villages certainly would have a better claim to have their expenditures for flood control and prevention repaid them than is the case in the lower Mississippi, where the federal government has already paid for them with more than twenty million acres of public land.
- (2) The cost of all this would run into the billions, possibly into the hundreds of billions.
- d. Undertakings that have cost the federal government billions in the end have often begun in a comparatively small way, just as a small leak in the top of a dam leads quickly to a mighty flood.
 - (1) This is illustrated by the history of our pension system.
 - (2) Another good example is the system of federal aid.
- B. For the national government to assume the entire responsibility and pay the entire cost of flood control would be a serious danger to our decentralized federal system of government.
 1. It would be a vast extension of the powers, duties, functions and expenses of the national government.
 - a. It would extend the activities of the federal government to a new and vast field.

- b. If carried to its logical conclusion it would bring the federal government in a new capacity into every state and community in the land.
 - c. It would increase enormously the cost of the federal government.
 - d. It would vastly increase the present army of over six hundred thousand tax fed federal employees.
 - e. It would augment the evils of bureaucracy, from which the government now suffers.
2. It would mean another great decline in the power and the importance of the states.
- a. Our federal system has already been greatly impaired by the decline of the states, because of the voluntary surrender of their powers and duties to the national government.
 - b. In the past the states have always reserved to themselves the right to locate, build and control all flood control and flood prevention works.
 - c. The system of federal aid showed how the states would freely surrender their powers and duties simply to get dollars from the federal government.
 - (1) In 1921 Governor Blaine of Wisconsin denounced federal aid as "a species of bribery" in a message to the legislature.
3. Our federal system, already endangered by the overgrowth of the central government at the expense of the states, would be thrown out of balance by this further step.

THE REFERENCE SHELF

- a. For several years the ablest men in America have been warning us of just this danger.
 - (1) President Coolidge has often uttered this warning.
 - (2) Nicholas Murray Butler, president of Columbia University, has repeatedly expressed the same idea.
 - (3) Governor Albert C. Ritchie of Maryland has very often preached the same gospel.
 - (4) Hundreds of others, including most of the men who are now clamoring for federal flood control, have recently voiced this same warning.

III. It is impracticable for the federal government to assume entire responsibility and pay the entire cost of flood prevention and control on the lower Mississippi.

- A. It is a new and entirely untried policy.
 - 1. It is contrary to all of our past policy.
 - 2. It is without precedent in American history.
- B. Local contribution, even in small part, is a practical remedy for the dangers of the proposed system.
 - 1. It will prevent unreasonable demands and unnecessary work.
 - 2. It will entirely eliminate pork barrel methods of dealing with the federal government.
- C. It involves grave dangers and is open to serious abuses.

1. It is doubtful if the federal government has the constitutional right to conduct flood control work.
 - a. Some statesmen believe the federal government has no constitutional right to go into a state and build a levee where the state does not want it. (*House Hearings*. 1927. p. 1124-6).
 - b. If the federal government took over entire responsibility for flood control work and engaged to pay the entire cost, and then found itself without full power to manage and direct it, unity of action would be impossible and chaos would follow.
2. Nobody is able to foretell or to foresee what the ultimate results of the policy would be.
 - a. This country is just at the beginning of its water power development.
 - b. Federal control of the river banks of the country is sure to have an effect upon, probably to involve control of, locks, dams, irrigation, navigation and the production, transmission and distribution of electricity generated by water power.
 - c. It is therefore clear that turning over to the federal government jurisdiction and management of flood control, may be also turning over vast and far reaching powers that will fundamentally alter our system of government.
3. The negative side of this question has not yet been adequately presented to Congress.

- a. So far all opposition has been drowned by the violent screams of the pork barrel politicians who talk in favor of states rights and vote against them.
- D. It is opposed by the best thought of the country.
1. President Coolidge has repeatedly expressed his opposition to the plan, saying that the states should contribute at least 20 per cent of the cost, although he has said frankly that flood control on the lower Mississippi is a national problem.
 2. General Jadwin, chief of the army engineers, has taken the same position.
 3. The Mississippi River Commission also opposes the plan.

BIBLIOGRAPHY

An asterisk (*) preceding a reference indicates that the article or a part of it has been reprinted in this volume. A dagger (†) is used to indicate a few of the best references.

BIBLIOGRAPHIES

Carnegie Library of Pittsburgh. Floods and flood protection: references to books and magazine articles. 45p. '08.

Library of Congress. Literature on the Mississippi and other rivers dealing especially with flood conditions and control of floods by levees and reservoirs. 10p. typw. F. 11, '14.

†United States. House of Representatives. Bibliography on flood control. Committee doc. no. 4. 70th Congress, 1st Session. 83p. '28.

GENERAL REFERENCES

BOOKS AND PAMPHLETS

Alvord, John W. and Burdick, Charles B. Relief from floods. McGraw-Hill. N.Y. '18.

Beman, Lamar T. States rights. H. W. Wilson. N.Y. '26.

*Chamber of Commerce of the United States. Referendum no. 51 on the report of the Committee on Mississippi flood control. 39p. Wash, D.C. O. 31, '27.

International Engineering Congress. Transactions. San Francisco, S. 20-25, '15. Neal. San Fran. '16.

p. 110-253. Flood control, with particular reference to conditions in the United States. H. M. Chittenden et al.

McEathron, W. J. and Hidinger, L. L. The prevention of overflow of the Little Wabash and Skillet Fork rivers. Illinois Rivers and Lakes Commission. 40p. '11.

- Russell, Thomas. *Meteorology*. Macmillan. N.Y. '95.
p. 198-274. Rivers and floods.
- Shepard, Ward. *Forests and floods*. U.S. Department of Agriculture, circular no. 19. 24p. Ja. '28.
- United States. Department of Agriculture. *Yearbook 1901*. Wash., D.C. '02.
p. 477-86. Floods and flood warnings. H. C. Frankenfield.
- United States. House of Representatives. *Flood control: comparison of flood control plans*. Committee doc. no. 8. 70th Congress, 1st Session. 3p. '28.
- †United States. House of Representatives. *Flood control: hearings before the Committee on flood control*. 70th Congress, 1st Session. 6 pts. 4924p. '27-'28.
- United States. House of Representatives. *Flood control in the Mississippi valley: report of William F. Mulvihill et al.* Committee doc. no. 20. 70th Congress, 1st Session. 5p. '28.
- United States. House of Representatives. *Flood control: report of Committee of chief engineers of railroads operating in Mississippi valley on plan of army engineers*. Committee doc. 23. 70th Congress, 1st Session. 8p. '28.
- United States. House of Representatives. *Flood sufferers in the Mississippi and Ohio valleys*. J. E. Normoyle. Doc. no. 1453. 62d Congress, 3d Session. '13.
- United States. House of Representatives. *Mississippi river flood control: tables showing effect of 1927 flood on levee system, etc.* Committee doc. no. 12. 70th Congress, 1st Session. 5p. '28.
- United States. House of Representatives. *Plan for flood control in the Mississippi valley by means of lower flood levels through outlets and spillways below the Arkansas river*. J. P. Kemper. Committee doc. no. 10. 70th Congress, 1st Session. 147p. '28.
- United States. House of Representatives. *Preliminary examinations and surveys for flood control: hearings*

- before the committee on flood control. Mr. 18-Ap. 1, '26. 118p. '26.
- United States. House of Representatives. Report on improvement of Mississippi river for navigation. Committee doc. no. 6. 70th Congress, 1st Session. 25p. '28.
- United States. House of Representatives. Report on the control of floods of the Mississippi river by means of diversion channels. Committee doc. no. 3. 70th Congress, 1st Session. 18p. maps, plates, tables. '27.
- United States. House of Representatives. Report on the control of floods of the Mississippi river by means of reservoirs. Committee doc. no. 2. 70th Congress, 1st Session. 56p. '27.
- United States. House of Representatives. Spillways on the lower Mississippi river: letter from the Secretary of War, etc. H. doc. no. 95. 70th Congress, 1st Session. 28p. maps. '27.
- †United States. House of Representatives. Committee on Agriculture. A report on the influence of forests on climate and on floods. Willis L. Moore. 38p. '10.
- United States. Senate. Gila river flood control: report of Frank H. Olmstead. S. doc. no. 436. 65th Congress, 3d Session. 94p. '19.
- World Almanac. '28. p. 173-4. The Mississippi river floods.

PERIODICALS

- Agricultural Review. 20:1. Jl. '27. Control the floods. American Farm Congress.
- Agricultural Review. 20:9. Jl. '27. Must prevent future floods. Clark E. Jacoby.
- Agricultural Review. 20:11. S. '27. "Levees only," wrong policy. Walter Parker.
- American City. 14:437-40. My. '16. A plan for the protection of the Miami valley district from flood damage. Arthur E. Morgan.

- American City. 19:482-4. D. '18. Controlling an erratic stream with concrete. R. W. Stewart.
- American City. 23:301-3. S. '20. Controlling the floods of Los Angeles county.
- American City. 23:589-90. D. '20. Concrete bridges and flood walls are features of flood prevention plan in Tiffin, Ohio. J. I. Oberlander.
- American City. 33:381-4. O. '25. The Pueblo conservancy project. Earl C. McCain.
- American City. 34:89. Ja. '26. Flood storage lakes in Oklahoma. Stanley C. Draper.
- American City. 35:69-73. Jl. '26. Flood protection for Freeport, Ill. W. G. Potter.
- American City. 35:509-15. O. '26. Solving the flood problem at Wichita, Kansas. P. L. Brockway.
- American Forestry. 22:476-9. Ag. '16. Southern floods and their forestry lessons. Herman H. Chapman.
- †American Forests and Forest Life. 33:387-92, 432. Jl. '27. Do forests prevent floods? Raphael Zon.
- †American Forests and Forest Life. 33:409-10, 446-7. Jl. '27. The part of forestry in flood control. W. B. Greeley.
- American Forests and Forest Life. 34:149-50, 186-7. Mr. '28. Leavitt hits flood program.
- American Journal of Public Health. 14:677-80. Ag. '24. Flood sanitation in the valley of the Potomac between Maryland and West Virginia. E. S. Tisdale.
- †American Mercury. 11:257-63. Jl. '27. Forests and floods. Willis L. Moore.
- †Annals of the American Academy of Political and Social Science. 135:1-96. Ja. '28. Mississippi flood control. Symposium.
- Bulletin of the University of Utah. 15:3-20. Mr. '25. The floods of 1923 in northern Utah. J. H. Paul and F. S. Baker.
- Commerce and Finance. 16:1101-2. Jl. 1, '27. And the waters prevailed. A. H. Stone.

- Commerce and Finance. 16:1495. Jl. 27, '27. Hoover's flood control plan.
- Commercial and Financial Chronicle. 125:600. Jl. 30, '27. Mississippi flood control plan submitted to President.
- †Congressional Digest. 7:41-54, 69-70. F. '28. Congress and Mississippi flood control. Symposium.
- Congressional Record. 69:279-81. (current file). D. 8, '27. Flood control. William W. Hastings.
- Congressional Record. 69:760-2. (current file). D. 16, '27. Flood control. James O'Connor.
- Congressional Record. 69:1018-22. (current file). Ja. 4, '28. Address at the National rivers and harbors congress. Edgar Jadwin.
- Congressional Record. 69:1244-5. (current file). Ja. 9, '28. The disposal of water. Willis G. Sears.
- Congressional Record. 69:1247. (current file). Ja. 9, '28. Flood control. Everette B. Howard.
- Congressional Record. 69:2364-7. (current file). Ja. 31, '28. The flood of 1927. William E. Hull.
- *Congressional Record. 69:2481-3. (current file). F. 2, '28. The place of forestry in any comprehensive flood control program. Scott Leavitt.
- Congressional Record. 69:3405-7. (current file). F. 20, '28. Report on reservoir control of flood waters. William J. Driver.
- *Congressional Record. 69:3424-5. (current file). F. 21, '28. Damage caused by floods. Herbert Deakyne and Rene F. Clerc.
- Congressional Record. 69:5090-1. (current file). Mr. 16, '28. Relief for Vermont in reconstruction of highways damaged by flood of 1927. Elbert S. Bingham.
- Congressional Record. 69:5092-3. (current file). Mr. 16, '28. The Vermont flood. Ernest W. Gibson.
- Congressional Record. 69:5522-4. (current file). Mr. 24, '28. Flood control. John Morrow.

- Congressional Record. 69:5594-8. (current file). Mr. 26, '28. Flood control. James O'Connor.
- Congressional Record. 69:5685-6. (current file). Mr. 28, '28. The Jones bill.
- Congressional Record. 69:6889-915. Ap. 17; 6983-7005. Ap. 18; 7028-56, 7077-81. Ap. 19; 7212-13. Ap. 20; 7294-323, 7361-2. Ap. 23; 7406-23. Ap. 24, '28. (current file). Debate on flood control in the House. Frank R. Reid, James A. Frear, et al.
- Congressional Record. 69:7427-8. (current file). Ap. 24, '28. The flood control bill as it passed the House.
- Cornell Civil Engineer. 24:459-68. Je. '16. Some recent aspects of flood control. R. M. Riegel.
- Current History. 26:458-9. Je. '27. The Mississippi flood. Albert B. Hart.
- Current History. 26:630-2. Jl. '27. Devastations of the Mississippi flood. William MacDonald.
- Current History. 27:268-9. N. '27. Plans for national flood relief and control. William MacDonald.
- Engineering and Contracting. 45:382-5. Ap. 26, '16. Retarding basin plan of flood control for Dayton. Arthur E. Morgan.
- Engineering News. 69:800-3. Ap. 17, '13. The problem of flood control. C. M. Townsend.
- †Engineering News. 69:915-16. My. 1, '13. Is man responsible for floods? Editorial.
- Engineering News. 77:12-17, 62-5, 144-50, 186-8, 260-4. Ja. 4, 11, 25; F. 1, 15, '17. Miami valley flood protection work.
- Engineering News-Record. 94:508-14. Mr. 26, '25. How the Mississippi river is regulated. Charles L. Potter.
- Engineering News-Record. 94:556-9. Ap. 2, '25. Some suggested ways of controlling the Mississippi floods. Charles L. Potter.
- Engineering News-Record. 98:851. My. 26, '27. Mississippi floods not a development of recent years.

- Engineering News-Record. 98:980-2. Jl. 16, '27. Mississippi problem outlined by chief of engineers.
- Engineering News-Record. 99:300-1. Ag. 25, '27. Makeup of breached levees given in report by Col. Potter.
- Engineering News-Record. 99:636-9. O. 20, '27. Civil engineers consider Mississippi floods.
- Engineering News-Record. 99:670-3. O. 27, '27. Work of Mississippi river commission outlined. C. W. Kutz.
- Engineering Record. 74:162-3. Ag. 5, '16. "Cat and kitten" holes in outlet of dam control high and low flood discharges.
- Engineering World. 23:213-14. O. '23. Flood control in tidal streams. W. J. Roberts.
- †Harper's Monthly. 145:779-89. N. '22. Modern methods of flood protection. Charles P. Burton.
- Journal of Geography. 27:36-40. Ja. '28. The New England flood. Julia M. Shipman.
- Journal of the American Water Works Association. 17:727-39. Je. '27. Flood control in the Miami valley of Ohio. C. S. Bennett.
- Journal of Forestry. 26:222-30. F. '28. The Mississippi: symptomatic treatment or permanent cure? Gifford Pinchot.
- Literary Digest. 73:21-2. Je. 17, '22. Why there was not another Dayton flood.
- Literary Digest. 73:44-9. Je. 17, '22. Fighting behind the Mississippi levees.
- Literary Digest. 75:22-3. D. 9, '22. To tame the flood-mad Colorado.
- Literary Digest. 93:21-2. Je. 11, '27. Li-ping's flood cure; dig the bed deep, keep the banks low.
- Literary Digest. 94:10-11. Ag. 6, '27. Mr. Hoover's plan for flood control.
- *Literary Digest. 94:22. Jl. 30, '27. A Mississippi flood four hundred years ago.

- *Literary Digest. 95:8-9. D. 24, '27. The flood control fight in Congress.
- Literary Digest. 95:23-4. O. 15, '27. What the flood did to the railways.
- Literary Digest. 96:10-11. Mr. 10, '28. Nothing done yet for flood control.
- Manufacturers Record. 91:63-5. My. 12, '27. Congress must translate neglect into action to prevent floods that are a national disaster. Craddock Goins.
- Manufacturers Record. 91:65-8. My. 26, '27. Picture story of Mississippi valley flooded area. Craddock Goins.
- Manufacturers Record. 91:69. My. 26, '27. Flood control, a problem of economics and public policy first and of engineering skill next. Walter Parker.
- Manufacturers Record. 91:55-6. Je. 9, '27. Dawn of a new flood control policy. Richard W. Edmonds.
- Manufacturers Record. 91:59-62. Je. 9, '27. A great river conference at Chicago. George Garner.
- Manufacturers Record. 91:63-4. Je. 9, '27. Flood control by flood prevention. Richard W. Edmonds.
- Manufacturers Record. 91:69. Je. 16, '27. The problem of the Mississippi. Henry Loeb.
- Manufacturers Record. 92:69. Jl. 7, '27. An engineer's pen picture of the flood situation. Henry M. Payne.
- Manufacturers Record. 92:70. Jl. 7, '27. Secretary Hoover paints a dismal picture of loss and suffering.
- Manufacturers Record. 92:63-70. Ag. 4, '27. To save the Mississippi valley we must save the tributaries. Richard W. Edmonds.
- Monthly Weather Review. Sup. no. 29. O. 18, '27. The floods of 1927 in the Mississippi basin. H. C. Frankenfield et al.
- New Republic. 50:343-5. My. 18, '27. Can floods be prevented?
- New Republic. 51:216-17. Jl. 20, '27. After the flood.

- †New Republic. 53:64-7. D. 7, '27. Soil waste and the flood menace. Robert Stewart.
- †North American Review. 224:630-45. D. '27. The problem of the Mississippi. W. M. Black.
- Ohio Archaeological and Historical Quarterly. 34:474-503. O. '25. A history of flood control in Ohio. Arthur E. Morgan and C. A. Bock.
- Outlook. 131:109-11. My. 17, '22. Behind the levees. Frederick W. Jones.
- Outlook. 131:518-19. Jl. 26, '22. Mastering the Mississippi. Henry L. Sweinhart.
- Outlook. 140:46. My. 13, '25. Floods, forests, and the future.
- Outlook. 148:15-16. Ja. 4, '28. Reclamation politics in flood control.
- Outlook. 148:411. Mr. 14, '28. Pro and con on flood control cost.
- Professional Engineer. 12:8-12. Jl. '27. Flood control. E. E. Blake.
- Professional Engineer. 12:12-14. Ag. '27. Engineering experiences on the Mississippi. W. G. Price.
- Railway Age. 84:233-5. Ja. 28. '28. The Jadwin flood plan and the railroads.
- Review of Reviews. 66:525-31. N. '22. The battle with the Colorado. Edgar L. Hampton.
- Review of Reviews. 76:199-200. Ag. '27. Forests and floods. Willis L. Moore.
- Review of Reviews. 77:269-70. Mr. '28. New Orleans after the flood. John S. Kendall.
- Saturday Evening Post. 193:28-30. F. 12, '21. Regional flood control. Floyd W. Parsons.
- Saturday Evening Post. 195:8-9, 104-6. Jl. 15, '22. The water fighters. Harris Dickson.
- Saturday Evening Post. 199:30. Je. 18, '27. Trees and floods. Editorial.

- Scientific American. 120:282-3, 299-300. Mr. 22, '19.
The Miami conservancy flood prevention plan. W. A. Drake.
- Scientific American. 122:572, 584. My. 22, '20. Ohio's flood insurance. M. A. Henry.
- Scientific American. 123:399. O. 16, '20. Piling up the river bottom into a dike.
- Scientific American. 125A:38-9. N. '21. Making the flood dam itself. J. F. Springer.
- Scientific American. 126:315. My. '22. Flood and drought control on the North Platte. S. R. Winters.
- Scientific American. 130:246. Ap. '24. The next great flood—where? Harry A. Mount.
- †Scientific Monthly. 16:343-52. Ap. '23. Problems of flood control. Harry Taylor.
- Sunset. 50:17-20, 58-60. Mr. '23. Unity and the Colorado. Lewis R. Freeman.
- Survey. 37:721. Mr. 24, '17. Bridling the Mississippi. Morris Knowles.
- Survey. 58:357. Jl. 1, '27. Four stages of the flood.
- Survey. 58:358. Jl. 1, '27. The aftermath—mud and money. Will Irwin.
- Survey. 58:367-9. Jl. 1, '27. Prevention first. Gifford Pinchot.
- Survey. 58:370-7. Jl. 1, '27. Plan or perish. J. Russell Smith.
- †World's Work. 54:244-55. Jl. '27. Havoc beyond the levees: our greatest domestic disaster since the Civil war. Will Irwin.
- †World's Work. 54:405-15. Ag. '27. Can we tame the Mississippi? We face a bigger job than building the Panama canal. Will Irwin.
- *World's Work. 55:527-9. Mr. '28. The tools for flood control. Arthur E. Morgan.

AFFIRMATIVE REFERENCES

BOOKS AND PAMPHLETS

- United States. House of Representatives. Analysis of plans of army engineers and Mississippi river commission for flood control of Mississippi river. L. T. Berthe. Committee doc. no. 11. 70th Congress, 1st Session. 40p. '28.
- United States. House of Representatives. Flood control: statement of Hon. Frank R. Reid. Committee doc. no. 7. 70th Congress, 1st Session. 7p. '28.
- United States. House of Representatives. Flood control in the Mississippi valley: brief submitted by Alfred H. Stone. Committee doc. no. 16. 70th Congress, 1st Session. 14p. '28.
- United States. House of Representatives. Flood control in the Mississippi valley: brief submitted by Governor F. D. Samson of Kentucky. Committee doc. no. 13. 70th Congress, 1st Session.. 11p. '28.
- United States. House of Representatives. Flood control in the Mississippi valley: brief submitted by Governor John E. Martineau of Arkansas. Committee doc. no. 9. 70th Congress, 1st Session. 12p. '28.
- United States. House of Representatives. Flood control in the Mississippi valley: brief submitted by Governor O. H. Simpson of Louisiana. Committee doc. no. 19. 70th Congress, 1st Session. 23p. '28.
- United States. House of Representatives. Flood control in the Mississippi valley: brief submitted by North T. Gentry, Attorney General of Missouri. Committee doc. no. 15. 70th Congress, 1st Session. 3p. '28.
- United States. House of Representatives. Flood control in the Mississippi valley: brief submitted by Oscar Johnston. Committee doc. no. 22. 70th Congress, 1st Session. 7p. '28.

PERIODICALS

- American Forests and Forest Life. 33:421. Jl. '27. The Chicago flood control conference. Editorial.
- Congressional Record. 69:807-9. (current file). D. 17, '27. Flood control. Frederic M. Sackett.
- Congressional Record. 69:1016-18. (current file). Ja. 4, '28. Flood control. Joseph E. Ransdell.
- Congressional Record. 69:1104-6. (current file). Ja. 5, '28. Flood control. F. B. Swank.
- *Congressional Record. 69:1791-4. (current file). Ja. 19, '28. The flood of 1927. James W. Collier.
- Congressional Record. 69:1888-9. (current file). Ja. 20, '28. Flood control. James O'Connor.
- Congressional Record. 69:1995-6. (current file). Ja. 24, '28. Resolutions of legislature of state of Mississippi.
- Congressional Record. 69:3296-3304. (current file). F. 20, '28. Statement of American federation of labor and Chamber of commerce of the United States.
- †Congressional Record. 69:4562-8. (current file). Mr. 9, '28. Flood control. Harry B. Hawes.
- Congressional Record. 69:5164-5. (current file). Mr. 19, '28. Resolutions of the tristate committee.
- Congressional Record. 69:5320-5. (current file). Mr. 21, '28. Flood control. Heartsill Ragon.
- Congressional Record. 69:5452-5. (current file). Mr. 23, '28. Flood control. Willis G. Sears.
- Congressional Record. 69:5497-9. (current file). Mr. 24, '28. Flood control. James A. Reed.
- Congressional Record. 69:5546-7. (current file). Mr. 24, '28. Flood control. Luther A. Johnson.
- Congressional Record. 69:5660-2. (current file). Mr. 27, '28. Flood control. Ralph F. Lozier.
- Congressional Record. 69:5685-93. (current file). Mr. 28, '28. Flood control. Wesley L. Jones.

- †Congressional Record. 69:5846-93. (current file). Mr. 29, '28. The Mississippi river flood. Frank R. Reid. Congressional Record. 69:6248-9. (current file). Ap. 5, '28. Flood legislation. John L. Cochran. Congressional Record. 69:6346-8. (current file). Ap. 9, '28. Flood control. James B. Aswell. Congressional Record. 69:6391. (current file). Ap. 9, '28. Flood control. C. C. Dickinson. Manufacturers Record. 91:61. My. 26, '27. Who owns the river? Douglas Mallock. Manufacturers Record. 92:56. D. 15, '27. The presidential message blunders on flood control. Nation. 125:467. N. 2, '27. National flood control. Nation's Business. 15:42-4. N. '27. Flood control, a national task. L. C. Speers. National Real Estate Journal. 29:47-9. Ja. 23, '28. Flood control. Walter Parker. Pocket Bulletin. 27:14-15. Jl. '27. A suggestion on flood protection. Walter Parker. Scientific American. 138:144-6. F. '28. Curbing the Mississippi. J. B. Walker. Survey. 58:359. Jl. 1, '27. Louisiana looks to Washington. John M. Parker.

NEGATIVE REFERENCES

BOOKS AND PAMPHLETS

- *Coolidge, Calvin. Message to Congress. D. 6, '27. United States. House of Representatives. Flood control in the Mississippi valley: message from the President transmitting the report of Gen. Jadwin. H. doc. no. 90. 70th Congress, 1st Session. 35p. '27. United States. House of Representatives. Special report of the Mississippi river commission on revision of plans for improvement of navigation and flood control of the Mississippi river. Committee doc. no. 1. 70th Congress, 1st Session. 329p. '27.

PERIODICALS

- †Chicago Tribune. My. 2, '28. Pork barrel pool is bared: votes traded to put across treasury raids.
- *Cleveland Plain Dealer. My. 3, '28. Big scale log rolling. Editorial.
- Commercial and Financial Chronicle. 125:3295-7. D. 17, '27. Flood control plan of army engineers transmitted to Congress by President Coolidge.
- †Congressional Record. 69:6149-63. (current file). Ap. 4, '28. The flood control bill. James A. Frear.
- Congressional Record. 69:6834-40. (current file). Ap. 16, '28. Flood relief; a comprehensive plan. M. C. Garber.
- *Engineering News-Record. 98:931. Je. 9, '27. Calm thought needed.
- †Literary Digest. 97:10-11. Ap. 14, '28. Suspicious of "pork" in the flood control bill.
- Outlook. 148:610. Ap. 18, '28. Is flood control safeguarded?

GENERAL DISCUSSION

THE TOOLS FOR FLOOD CONTROL¹

The plumber who has to go back to the shop because he has forgotten some of his tools is not the best plumber. The biggest plumbing job in the world is on the lower Mississippi. Uncle Sam seems to have set out to do the job and left some necessary tools behind. He may have to go back after them and lose some valuable years. Perhaps his attention can be drawn to his needs in time.

To bring to perfection a great public work, all of the main conditions that vitally affect that work must be reasonably favorable. Several conditions may be favorable, but if some controlling influence is out of harmony, then the whole work may be deformed and mutilated. The writer has acted as chief engineer on some large flood control projects in this country, and it has been his business to try to insure that all the major conditions were favorable to complete success.

First: there must be a thorough-going collection of information on which plans may be based. Engineers are not magicians with a special sense to tell them what to do. Only when they know the facts can they prepare adequate plans.

Second: there must be careful elimination of less desirable plans by careful and accurate comparison. Just as engineers are not magicians at making plans

¹ By Arthur E. Morgan. *World's Work*. 55:527-9. March, 1928. Mr. Morgan is one of our foremost authorities on flood control. As an engineer he has planned and superintended seventy-five water control projects, and the drainage codes of six states bear the marks of his helpful thought and experience. Mr. Morgan is president of Antioch College, in Yellow Springs, Ohio.

without the facts, neither do they have divine inspiration to pick the best plan with a mass of facts before them.

Experience, theoretical insight and keen imagination may suggest possibilities, but only the most painstaking calculations and comparisons can finally select the most economical and most effective methods. Nearly always when the writer has settled on the chief features of some engineering project people come to him and say: "I thought of that plan and favored it long ago." It is not simply thinking of a plan and favoring it that makes good engineering design, but the thorough and definite estimates and comparisons that finally bring about the definite elimination of all elements that do not show up as most favorable in such comparisons. The engineer's "hunch" or intuition or bright idea is good for a suggestion, but fatal as a method of determining design.

Third: there must be effective administration, so that the right things shall happen at the right time. At a certain time it will be necessary that all information shall be available for the completing of plans, at a certain time the plans must be finished in their main features, so that a definite program may be adopted. At a certain time the distribution of costs must be determined. Later there must be suitable financing, contracts let, right of way secured and the work actually constructed. When this whole program is seen from the beginning there can be an economy and an effectiveness that can never be approached by letting a great development "just grow," like Topsy in the corn field.

Fourth: there must be adequate financing. If the other steps are well taken, and if the project is economically sound, this will generally follow as a matter of course. Difficult financing usually means either a new and unfamiliar field or a project of questionable economic soundness or a badly administered development.

Fifth: the factor that I put last should really come first, but it can be better understood with the foregoing introduction: it is a satisfactory legal foundation. For all the public work of our nation the laws of our nation and of the various states are the underlying charter and control. We can do only that public work that the laws allow and provide for. If the legal structure is sound, fair and skillfully designed to serve its purpose, then the whole development may move forward with smoothness and precision. If those laws are crudely drawn, without understanding of the problem, if unfair practices are intrenched and necessary powers omitted, then all other elements in the program may be ideal, and yet the whole development may be a monstrosity as compared with its best possibilities.

In flood control engineering I have found that the best way to make haste toward final and satisfactory completion of a great project is to begin by looking into the laws under which the proposed work must be done. In six different states during the past twenty-four years I have found it desirable to construct a complete legal code that would provide for every phase of the work in question. In doing that it has been necessary to make a study of nearly every water control code in Europe and America. I believe that insufficient attention has been given to this phase of flood control in Europe and in most American states. With a finely built law a great project moves with a smoothness, an economy and efficiency, a fairness and an absence of irritation that is a revelation to those who have worked only codes that grew up like Topsy.

Now, all this is extremely pertinent to flood control on the Mississippi river. We should be further along with flood prevention if there had been a more orderly and thorough collecting of information. Engineers on the Mississippi have sometimes been would-be magicians,

coming to their conclusions without the data. But that is not a part of this story.

Under the federal Constitution it is generally held that the right of the national government in our interstate streams is limited to the control of navigation. This limitation has led to a vast amount of well-meaning hypocrisy. The building of levees along the lower Mississippi was begun in the guise of helping navigation. Little by little we have arrived at a tacit amendment to the Constitution, and it is now generally understood that the federal government may build levees for flood control.

This informal amendment to or reinterpretation of the Constitution, however, is a one-sided affair. The federal government has assumed obligations, but has not acquired the powers necessary to execute those obligations in an effective and economical manner. We need a national water control statute, which will enable the federal government to plan its work in a civilized, orderly manner, taking into account all the interests and issues involved. Such a code should provide for the organization of water control districts, for the determination of interests and responsibilities, for the cooperation of states, municipalities and other interests. It should give the federal government the power to condemn right of way for its work. In general, it should be a modern, well-organized water control code providing in an organic and orderly manner for every function that must be exercised in a great improvement.

Two steps can be taken toward that orderly development. *First:* we can begin the presentation and adoption of an amendment to our federal Constitution. This could read: "The Congress shall have power to provide for and to regulate the control and use of the waters of the nation." The words "interstate waters" are not

used, as that would prevent cooperation of the federal government in streams like the Sacramento river, which is in one state, but for which government cooperation is desired. There are many important flood control problems in America beside the Mississippi that are definitely interstate in character, and where nothing but interstate action can bring effective relief. For fifty years great projects have been bungled and mutilated because the federal government lacked adequate powers. Every one has wanted quick action, and no one has wanted to wait for an amendment to the federal Constitution. Let us start the amendment on its way. We shall still be sorely in need of it when it comes.

Second: a federal water control statute can be passed, to be effective only between those states that enact the necessary legislation to give it force. A few states, where the issues are keenest, might in this way avail themselves of the advantage of such a code.

Effective flood control on a national scale in America will not come by accident. It may delay for generations unless the right conditions arise. One of these conditions is an effective foundation in law, and such a foundation can scarcely exist without an amendment to the federal Constitution.

A MISSISSIPPI FLOOD 400 YEARS AGO²

Those who think that anything has happened of late to increase the violence of floods in our great rivers are invited to peruse an account of a flood in the Mississippi river in 1543, given by Garcilaso de la Vega in a history of De Soto's expedition on the North American continent, entitled *La Florida del Inca*. This record, thinks *The Engineering News-Record* (New York),

² From *Literary Digest*. 94: 22. July 30, 1927.

goes a long way toward proving that deforestation has had little or nothing to do with floods in the Mississippi valley. The volume containing the description of the flood was found we are told, by Glenn W. Caulkins, superintendent of schools in Cashmere, Washington, while in Peru. A translation of it was published recently in the *Wenatchee Daily World*. We read:

The account begins by describing how Fernando De Soto sailed from Havana, Cuba, in 1539, landed at what is now Tampa, Florida, and traversed Florida, Georgia, North and South Carolina and Alabama. He crossed the Mississippi, which he called the Rio Grande, near Memphis and traveled through Arkansas and Louisiana returning to the Mississippi, where the remnants of the expedition while preparing boats to go down the Mississippi to reach Mexico were attacked by Indians. At that juncture a flood occurred in the Mississippi which was described as follows:

Then God, our Lord, hindered the work with a mighty flood of the great river, which, at that time—about the 8th or 10th of March (of 1543)—began to come down with an enormous increase of water; which in the beginning overflowed the wide level ground between the river and the cliffs; then little by little it rose to the top of the cliffs.

On the 18th of March of 1543, which that year was Palm Sunday, when the Spaniards were marching in procession, the river entered with ferocity through the gates of the town of Aminoya, and two days later they were unable to go through the streets except in canoes.

The flood was forty days in reaching its greatest height, which was the 20th of April, and it was a beautiful thing to look upon the sea where there had been fields, for on each side of the river the water extended over twenty leagues of land and all of this area was navigated by canoes, and nothing was seen but the tops of the tallest trees.

On account of these inundations of the river the people build their houses on the high land, and where there is none, they raise mounds by hand, especially for the houses of the chiefs; the houses are constructed three or four stages above the ground, on thick posts that serve as uprights, and between uprights they lay beams for the floors, and above these floors which are of wood, they make the roof, with galleries around the four sides of the house where they store their food and other supplies, and here they take refuge from the great floods. The floods do not occur every year, but when in the regions where the rivers have their source there have been heavy snows the preceding winter with rains in the following spring; and thus the flood of 1543 was very great on account of the heavy snow the preceding winter. These floods occur every fourteen years, according to what an old Indian woman told us, which can be verified if the country is conquered, as I hope it will be.

Toward the end of April the flood began to subside, as slowly as it had increased, so that even by the 20th of April the Spaniards were unable to walk in the streets except by wading in the water. By the end of May the river had returned within its banks.

THE FLOOD RECORD^{*}

The flood problem on the lower Mississippi river stands out distinct and unique among the internal problems of the nation:

First: Because of the extensive area damaged. Previous to the era of levee construction the total area of lands below Cairo subject to overflow was 29,790 square miles. In 1897 the flooded area was 13,580 square miles; in 1903 it was 6,820 square miles; in 1912 it was 17,605 square miles; in 1922 it was 13,200 square miles and in 1927 it was 23,000 square miles.

Second: Because of the duration of the floods that affect so extensive an area. The water remains on the ground inundated from two to four months (April to July), affecting the planting season.

Third: Because of the magnitude of the problem of flood control.

There is a flood in the lower Mississippi river every spring which puts the river out of its banks, but every few years (on an average of about once in five years) there is a great flood as is illustrated by the data given below:

Flood of 1718—"An extraordinary rise of the Mississippi this year."—Francois Xavier Martin.

Flood of 1735—Gayarre states that "in this year the waters were so high that many levees were broken and much damage was done."

Flood of 1770—"A great flood," according to the tradition recorded by Governor Sargenit.

Flood of 1782—"This year the Mississippi rose to a greater height than was remembered by the oldest inhabitants."—Francois Xavier Martin.

Flood of 1785—"A great flood at St. Louis in April, said to have been equal to that of 1844."

Flood of 1791—"Same remarks at New Orleans as for flood of 1785."

^{*} From *Referendum* no. 51, Chamber of Commerce of the United States. p. 29-32.

Flood of 1796—"The Teche overflowed its banks for some 60 miles above New Iberia and poured into Grand Lake in a smooth sheet of water."

Flood of 1799—"Same remarks at New Orleans as for flood of 1785."

Flood of 1809—"A disastrous flood, which, according to Governor Sargent's notes, inundated all the plantations near Natchez and destroyed the crops. It was imagined by the sufferers that the northern lakes had found a channel to the river."

Flood of 1811—"There was a great flood this year."—Breckenridge.

Flood of 1813—"Was 6 to 8 inches higher than 1811."—Breckenridge.

Flood of 1815—"A very great flood. At the mouth of the Ohio it attained the highest point ever recorded, two feet above the high water of 1858."

Flood of 1816—"Same remarks at New Orleans as for flood of 1785."

Flood of 1823—"This was a great flood, which was highest at Napoleon on June 1st and at Natchez on May 23d. A great number of crevasses occurred below Red river on both banks of the river."

Flood of 1824—"This flood was 0.7 of a foot below the high water of 1815, or 1.2 feet below that of 1859, at Natchez, according to the notes of Mr. Samuel Davis."

Flood of 1828—"This flood occurred before the country above Red river landing was much settled and is almost universally claimed to have been the greatest flood of the present century."

Flood of 1844—"At St. Louis it exceeded the preceeding rise by more than 8 feet and all other floods of which we have records by more than 4 feet."

Flood of 1849—"Its highest stand occurred about the middle of February, when it was 3.3 feet below the high water of 1858. In the latter part of March it again reached nearly the same level."

Flood of 1850—"This flood was caused by heavy rains, which produced freshets successively in the Arkansas, Red and Black rivers, and thus flooded the whole region below Napoleon. The water did not subside until the middle of June. The damage occasioned by the flood was immense. The St. Francis and Yazoo bottoms were not protected by levees, and both were deeply flooded."

Flood of 1851—"Excepting the floods of 1844 and of 1858, this was the greatest flood at St. Louis of which we have records. The flood of 1858 was 0.4 of a foot above that of 1851. At Cape Girardeau the flood of 1851 exceeded the flood of 1858."

Flood of 1858—"For seven days it amounted to 1,475,000 cubic feet per second. It inundated the city of Cairo. It washed away miles of the insignificant levees along the St. Francis front, and poured rapidly into the bottom lands of that river, which were already deeply overflowed from heavy rains and from the crevasses of the April rise."

Flood of 1859—"The highest point attained at Memphis in 1859 was 0.1 of a foot below the high water of 1858. At Vicksburg it was 1.3 feet above the high water of 1858."

The normal flood conditions of the different tributaries are as follows:

The upper Mississippi has a single annual swell reaching its height about the middle of May and then falls steadily until the latter part of August. From then until January a quite uniform low level obtains after which the annual rise begins, reaching its crest in May.

The Missouri has generally a winter swell which is small, after which it falls slightly until the middle of May when a rapid rise occurs, reaching its height about the last of June. From June to December the fall is continuous, being most rapid at the first of the period. The Mississippi and the Missouri combined show the effect of these two rises by the much longer period of high water at St. Louis, the Mississippi rise being followed by the Missouri rise.

The regimen of the Ohio shows a low stage about the middle of October. In November a sharp rise sets in and continues until the latter part of January, after which there is a slight falling off. The rise is again resumed in February and the highest stage is reached near its mouth early in March. The water remains high to the middle of April and then recedes rapidly at first. Accordingly, the early rise of the Ohio followed by the upper Mississippi and then the Missouri produces in the Mississippi at Cairo a main swell which reaches its height about the middle of April. The period of flood stage is thus greatly lengthened and often marked by a series of swells. During the recent floods there were some eight or nine swells in the main stream below the mouth of the Ohio which continued the flood stage for approximately one hundred and ninety days.

The Arkansas river begins a gradual rise in November and attains its maximum height about the first of May. For a month or so the flood stage continues and then the decline is gradual until its autumn minimum is reached some time in August. Ordinarily little effect is produced on the Mississippi by the Arkansas discharge.

The Red river reaches its highest stage about the middle of May and the lowest the latter part of September. It has a much greater range than the Arkansas. Ordinarily it, too, has little effect on the normal Mississippi river floods.

The normal flood in the lower Mississippi near its mouth is characterized by a long steady rise and a correspondingly long fall. The conditions herein described are average conditions which when they occur at the average period of the months given do not produce destructive floods. The Missouri and the upper Mississippi are comparatively very dependent. The Ohio is less so and the Arkansas and Red rivers may be characterized as erratic. The variations from normal which are probable and the synchronizing of flood peaks of different streams produce the unusual and destructive floods.

NOTABLE FLOODS

Following the creation of the Mississippi River Commission in 1879 more definite information on flood heights became available. These are described in some detail in the following paragraphs:

FLOOD OF 1882

In this flood the lower Mississippi was high at the beginning of the year. During the early part of January the Mississippi at St. Louis, Cairo and Memphis was falling slightly, while from the effects of the rains in the St. Francis, White and Yazoo basins the lower section was rising. Into this well-filled lower stretch of stream was precipitated the first Ohio rise which kept the river quite full below Cairo until the second rise from the Ohio, principally from the upper Ohio, occurred, synchronizing with a sharp rise of the Mississippi at St. Louis.

FLOOD OF 1883

This flood was characterized by one great swell which established a new high stage on February 27 at Cairo. The rise was brought about principally by an Ohio flood which was aided somewhat by a rise in the upper Mississippi. This was a type of purely Ohio flood, the Ohio descending upon a rather low river below Cairo.

FLOOD OF 1890

The 1890 flood had three swells, principally from the Ohio. The peak was produced by a combination of heavy rains in the Ohio drainage and in the central valley. The Missouri, Arkansas and Red rivers played no part in the development of the flood.

FLOOD OF 1897

The genesis of this flood appears to have been as follows:

The lower Mississippi in the early part of February was at flood stage. Into it was poured a great flood from the Ohio. At the same time the alluvial bottom land had been filled by heavy rainfall. The river was brought to full flood by the middle of March. It was then maintained in flood chiefly by heavy rainfall over the central valley and Arkansas basin aided by

high water in the upper Mississippi. The river was at flood height for nearly two months.

This flood overflowed nearly fourteen thousand square miles of the central valley. Losses resulted from many causes, among which may be enumerated the destruction of buildings, fences, levees, the drowning of stock, ruining of crops, and prevention of subsequent planting. A large area was flooded in the St. Francis basin. The levees along the main Mississippi extended at this time a distance of one hundred and twenty-five miles. The effect of leveeing the west bank of the Mississippi compelled the water to pass down from Cairo to Helena without relief into the St. Francis basin. Below Helena the flood proved to be the most disastrous on record. The losses were principally property damage and loss of livestock. No loss of human life appears recorded.

FLOOD OF 1903

The flood of 1903 was another Ohio flood. The rise was practically continuous from Cairo to the gulf, similar to the 1897 flood with the exception that in the 1903 flood there was no rise of consequence above the mouth of the Ohio on the Mississippi. The Red and Ouachita rivers contributed materially to the lower river stages. There was also during the flood and previously a heavy precipitation on the central alluvial bottom lands.

Since the 1897 flood the St. Francis system of levees had been extended from one hundred and twenty-five to one hundred and seventy-five miles along the west bank of the Mississippi. As a result, some three thousand square miles additional of flood plain had been reclaimed from the river and the immense volume of water which had formerly found relief in this area was confined to the river channel, the direct consequence of which was an abnormal increase in the height of flood crest without an unusual increase in initial flood volume at Cairo.

FLOOD OF 1912

The annual rise of the lower Mississippi river in this year was accentuated by a severe storm from the southwest which moved northeastward over the lower Mississippi and Ohio valleys attended by general and heavy rains. There were two crests in the Mississippi river at St. Louis which met high flood stages in the Ohio. Flood stage prevailed for forty-five days in all. At New Orleans there was a single crest of 22 feet, which was 1.6 feet above the previous high-water record. This crest stage represented the maximum effect of wind and water and was as high as it could have been under any combination of existing circumstances. The flood losses were similar to those of other floods, the estimated total damage to property being \$78,000,000.00, one-third of which was property exclusive of crops, and one-third crop damages.

FLOOD OF 1913

The flood of 1913 is generally considered the great flood of the Ohio. It was this flood which caused immense losses in the vicinity of Dayton, Ohio, and stimulated flood prevention measures later taken by the Miami Conservancy District. The river stages at St. Louis were considerably below previous records. Western tributaries were at moderate stage. Low crest stages occurred in the central valley toward the south due to breaks in the levees which occurred in the upper reaches below Cairo. The area overflowed, whether from crevasse water or backwater, was less in the 1913 flood than in the flood of 1912. Repairs to the 1912 breaks had not been wholly completed in many places when the 1913 flood occurred.

FLOOD OF 1922

The outstanding features of the 1922 flood are, first, the general distribution of the flood over all main tributaries, the only exception being in the Tennessee and Cumberland rivers. So far as actual records or reported tradition show, the main stream and all its tributaries had never before been in general flood at the same time; second, the 1922 flood had unprecedentedly high stages in its lower reaches below the mouth of the Arkansas and White rivers. Had the levees remained intact, the average stages of this flood would have been 1 foot higher over the previous records, according to Weather Bureau reports.

FLOOD OF 1927

The 1927 flood was similar in many respects to the 1922 flood. None of the major drainages, with the exception probably of the Arkansas and the central valley, can be charged with extreme flood conditions. The upper portions of the Mississippi drainage, including the Missouri, upper Mississippi and Ohio, contributed only in a small measure to the flood crest. However, heavy rains in their lower reaches brought all three streams into flood simultaneously, producing a record gauge height at Cairo and unprecedented flood conditions from there to the gulf because of floods encountered from the western tributaries and in the central valley. The western tributaries, the central valley, lower reaches of the Missouri and the Tennessee and Cumberland rivers are largely responsible for the 1927 flood, the greatest flood of the Mississippi of which we have any knowledge.

FLOOD FREQUENCY

Beginning with the year 1871, daily river data are quite complete for many places in the Mississippi drainage basin. The oldest records in the possession of the

Weather Bureau are those for Wheeling, West Virginia, which extend back of 1838. The Pittsburgh record is continuous from 1854 and the Cincinnati record from 1853. At Cairo the daily record covers from 1871 to date. The following table gives a summary of flood frequency:

SUMMARY OF SEVERE FLOOD FREQUENCY, 1871-1922, INCLUSIVE

Station	River	NUMBER OF FLOODS					Average	
		1871- 1880	1881- 1890	1891- 1900	1901- 1910	1911- 1922	Total 1871- 1922	Interval Between Floods
Cairo, Ill.	Ohio	4	8	5	2	6	25	2.08
Memphis, Tenn.	Miss.	0	0	0	4	6	10	5.20
Little Rock, Ark.	Ark.	4	2	2	1	0	9	5.78
Vicksburg, Miss.	Miss.	1	3	3	2	6	17	3.06
Alexandria, La.	Red	0	0	0	1	0	1	38.00
New Orleans, La.	Miss.	1	1	3	3	5	13	4.00

DAMAGES CAUSED BY FLOOD OF 1927

Crop losses:

Baled cotton damaged.....	\$2,828,850.00
Loss on average crop expected.....	16,028,024.00
Loss of rents on lands not cultivated by reason of overflow.....	12,190,300.00
Damage to growing cotton crop.....	13,497,237.00
Damage to sugar industry (report furnished by American Sugar Cane League).....	\$7,080,000.00
Cost to replant 34,000 acres of cane.....	3,400,000.00
Damage to growing crops other than cotton and sugar.....	10,480,000.00
Damage to matured crops.....	15,679,950.00
Damage to seed.....	2,083,260.00
	753,419.00

\$73,541,040.00
4,181,627.00

Cost of replanting.

Livestock losses:

12,626 horses and mules.....	1,269,150.00
2 counties in Missouri report livestock losses without giving number.....	45,000.00
25,716 cattle.....	633,075.00
133,174 hogs.....	1,153,929.00
2,560 sheep and goats.....	10,615.00
719,647 poultry.....	388,723.30

3,500,492.30

Property damage:

7,879 houses destroyed.....	3,341,650.00
46,840 houses damaged.....	6,724,625.00
2,200 houses destroyed or damaged (Arkansas).....	570,000.00
9,904 houses, stores, gins, barns and other buildings destroyed or damaged.....	1,535,750.00
Houses destroyed or damaged, no number given (Louisiana).....	50,000.00

Houses, stores, gins, barns and other buildings destroyed or damaged.....	3,601,562.00	12,481,937.00
118 stores destroyed.....	87,600.00	
Stores destroyed, no number given (Illinois).....	3,000.00	
2,138 stores damaged.....	625,150.00	90,000.00
10 stores destroyed or damaged (Arkansas).....	10,000.00	
Stores destroyed or damaged, no number given (Louisiana).....	5,000.00	
17 gins destroyed.....		640,100.00
235 gins damaged.....		118,000.00
2,997 barns destroyed.....		197,650.00
11,594 barns damaged.....	888,710.00	791,650.00
400 barns destroyed or damaged (Arkansas).....	160,000.00	
Barns destroyed or damaged, no number given.....	134,500.00	
16,971 other buildings destroyed.....		1,183,210.00
36,523 other buildings damaged.....	941,220.00	1,570,800.00
200 other buildings destroyed or damaged (Arkansas).....	20,000.00	
Other buildings destroyed or damaged, no number given.....	96,500.00	
Damage to merchandise.....		1,057,720.00
Damage to oil mills.....		1,628,711.00
Damage to farm implements.....		528,000.00
Damage to automobiles.....		1,317,515.00
Damage to feed.....		1,003,650.00
Damage to household goods.....		3,054,544.50
Damage to land by washing and spreading of obnoxious grasses.....		4,730,627.00
		4,736,750.00

⁴ Report of loss and damage by the 1927 floods in the Mississippi valley in the states of Illinois, Missouri, Kentucky, Tennessee, Arkansas, Mississippi and Louisiana prepared by the Mississippi River Flood Control Association. *Congressional Record*. 69: 3425. (current file). February 21, 1928.

DAMAGES CAUSED BY FLOOD OF 1927 (Continued)

Damage to fences	964,625.00
Damage to private roads and bridges.....	1,211,850.00
Damage to private ditches and drains.....	840,350.00
Business losses.....	41,489,999.50
Damage to school buildings and equipment.....	18,655,515.00
Damage to hardware lumber industry.....	399,841.29
Damage to coopeage industry.....	4,474,820.00
Damage to highways and bridges.....	258,952.00
Damage to railroads.....	2,738,122.00
Damage to public utilities.....	16,702,379.51
Cost of high water fight:	718,835.00
Mississippi River Commission.....	6,000,000.00
Levee boards.....	2,120,084.26
Board of Engineers (Louisiana).....	250,000.00
Closing crevasses (Mississippi River Commission).....	8,370,084.26
* Restoring levees to pre-flood condition.....	3,578,000.00
Damage, Caernarvon Crevasse.....	2,575,566.20
Damage, junior crevasse.....	5,000,000.00
War Department supplies furnished.....	350,000.00
Red Cross fund	7,000,000.00
Appropriated by the state of Illinois for relief.....	16,000,000.00
Loss of earnings of tenants and share croppers, average 137,733 people at \$20 per month, on a basis of 9 months' working season.....	2,000,000.00
Total	18,000,000.00
Number of lives lost, 183.	24,799,140.00
(Acres of crop land flooded in five states, 4,002,400. No report on number of acres flooded in Illinois and Kentucky).	236,334,414.06

REFORESTATION NOT A REMEDY⁵

(a) THAT REFORESTING WOULD NOT BE EFFICACIOUS

The best known place to be studied in this connection is the reservoir basin at the headwaters of the Mississippi river. Below Pokegama lake, just above Grand Rapids, Minn., a reservoir dam was built across the Mississippi river more than forty years ago (1884). The run-off from the entire watershed above that point is collected in this and two other reservoirs in the same basin. Aside from evaporation and allowing for change in amount of stored water, the entire run-off of this watershed has passed through Pokegama dam. Its discharge has been measured accurately for forty-two years and checked from the discharges of the two reservoirs above; the rainfall has been measured daily at the three dams for the same period, and the area of the watershed has been carefully determined as 3,265 square miles. Of this area, 584 square miles are lake surface and 2,681 square miles are land surface. The region is one where normal rainfall and normal evaporation are about equal. Therefore the rainfall over the lake surface is lost by evaporation and the measured run-off is that of the 2,681 square miles of land.

Thus we have with great accuracy the three features necessary to a complete determination of the relation of run-off to rainfall—area of watershed, rainfall and run-off.

In the forty-two years mentioned the basin has passed through all phases, from virgin forest, through the logging period and forward to agriculture or backward to a growth of scrub and young timber—autoforestation. Due to the fact that much of this area is Indian reservation and most of it poor agricultural land, it has largely

⁵ Special report of the Mississippi River Commission. November 28, 1927. p. 73-6.

gone backward rather than forward. The forty-two years' observations, divided into six seven-year periods, are as follows:⁶

Seven-year periods	Average annual rainfall in inches	Rainfall in millions of cubic feet ⁷	Run-off in millions of cubic feet ⁷	Run-off in percent- age of rainfall ⁷
1885 to 1891.....	25. 318	1,103,856	222,745	20. 18
1892 to 1898.....	26.417	1,151,774	261,460	22. 70
1899 to 1905.....	29. 687	1,294,967	442,545	34. 18
1906 to 1912.....	24. 446	1,066,379	252,565	23. 69
1913 to 1919.....	25. 420	1,108,292	284,002	25. 62
1920 to 1926.....	21. 583	941,078	148,933	15. 83

The first three periods cover the time from virgin forest to practically complete deforestation, as far as pine timber, the principal native growth, is concerned, and the last three periods cover a gradual relapse to scrub with the growth of young timber (autoforestation) and some advancement to farms. Thus we have in that basin observations covering every physical feature of importance in a study of run-off except extensive farming. The figures indicate an increased run-off as deforestation advanced, followed by a gradual reduction until the record for the last seven years shows (even taking into account the reduced rainfall) that the run-off is no greater than it was in the virgin-forest period.

Observations in a comparable region devoted to farming have been taken from the records of the United States Geological Survey made in 1909-1912 on the Minnesota river at Montevideo, Minn. Of these measurements the Geological Survey report says: "Conditions at this station are excellent and the results should therefore be reliable." The basin above this point covers an area of 6,300 square miles. It is in the great grain belt and very largely under cultivation. It is about 2° south of

⁶ From records of the United States engineer office, St. Paul, Minn., the office in charge of the reservoir system.

⁷ Totals for seven-year periods.

and about 1° west of the reservoir basin above Pokegama dam. Its average annual rainfall, determined from all observations available in 1913 at twelve carefully selected stations, was 23.27 inches as against a forty-two-year average for the Pokegama basin of 25.48 inches. From the Geological Survey records three complete consecutive years are available—August 1, 1909, to July 31, 1912. For these three years the entire rainfall in the Minnesota basin was 64.4 inches—92.3 per cent of the normal. For the same period the entire rainfall in the Pokegama basin was 71.05 inches—92.9 per cent of the normal. It therefore appears that there is no great difference in climatic and rainfall conditions between the two basins, and that such difference as exists must be looked for largely in the fact that one area is mostly undeveloped cut-over land, and the other is farmed extensively. There are possibly some differences in geological formation and natural soil conditions which may not make run-off comparison entirely dependent on surface conditions.

For the Minnesota basin, the three years' rainfall (64.4 inches) multiplied by the area (6,300 square miles) gives a total of 943,000,000,000 cubic feet, and the Geological Survey measurements show a run-off of 30,000,000,000 cubic feet, or 3.18 per cent. For the Pokegama basin the three years' rainfall (71.05 inches) multiplied by the land area (2,681 square miles) gives a total of 443,000,000,000 cubic feet, and the gaugings from the Pokegama dam (corrected for difference in storage) show a run-off of 79,000,000,000 cubic feet, or 17.81 per cent, more than five and one-half times that from the Minnesota basin. Regardless of possible geological and soil differences there can be no question that this comparison shows that farm lands reduce run-off more than do cut-over lands, and it has been shown above that cut-over lands have no greater run-off than do virgin forests.

The conclusion is inevitable that turning farms or wilderness back to forests will not reduce the run-off. If this be the case, farmed soil and its growth must absorb and evaporate more moisture than does the humus of the forest, and therefore to an equal extent must slow down, as well as reduce, the run-off.

Willis Luther Moore, Sc.D., chief of the United States Weather Bureau from 1895 to 1913, has recently stated:³

When the Seine inundated Paris several years ago the American press almost unanimously ascribed the disaster to the deforestation of the valley of the river. But M. Belgrade and other French engineers, who had made the hydrology of this valley their special study, showed that quite the contrary was the case. From the published works of Belgrade we learn that accurate observations go back to 1615. This places at our disposal five half-century periods, and I have before me a table in which is given a figure for each period, obtained by adding together the readings of the highest water each year, as recorded at the bridge of La Tournelle, and dividing the sum by 50. The figures are as follows: First period, 27.3 feet; second, 26.3; third, 25.3; fourth, 22.4; fifth, 21.2. M. Belgrade says:

The continued decrease of the floods for each half-century is remarkable, and yet the trees have steadily and unceasingly been cut down and the forest transformed into cultivated farms. What would we gain, then, in rewooding our fields?

Ernest Lauder, chief of the hydrographic bureau of the Austrian government, recently made an exhaustive study of and report on the history of the floods of the Danube, the great river of central Europe, for 800 years, taking into account 125 different floods. His conclusions are that progressive deforestation of the country has had no effect in increasing the frequency of floods or in augmenting their heights. He showed that the flood of 1899, which was a summer flood, was severest where it came from the heavily wooded districts.

A similar condition may be noted in the Mississippi valley. In 1844, long before the denudation of forest land on either the Missouri or upper Mississippi rivers, the St. Louis gauge showed a flood reading 3.4 feet higher than any ever known from 1785 to date—nearly a century and a half—and that at a time when there was

³ In an article entitled "Forests and Floods" printed in July, 1927 number of *The American Mercury*.

no constriction of the stream by levees, by bridges, or by cities like St. Louis and East St. Louis—when extensive forests exerted their full effort in reducing runoff and when river and valley had their full natural widths.

(b) THAT REFORESTING FOR FLOOD CONTROL WOULD BE
ECONOMICALLY UNSOUND

Even if it could be shown that reforestation would be beneficial in its effect on floods, it must be granted by its proponents that anything short of reforestation on a very large scale would not have a measurable effect on Mississippi river floods. Turning productive farm lands on such a large scale back to forests would be economically unsound.

This conclusion has no relation to reforestation as a conservation measure, which may in places be economically advantageous, but is intended to point out that, in selecting such areas, there is no added advantage in locating them in the Mississippi valley as an aid against flood menace in the lower Mississippi river.

(c) THAT THE REMEDY SOUGHT IN REFORESTING WOULD
BE TOO SLOW IN EFFECT

An important consideration in meeting flood menace is the element of time. Flood menace is of the near as well as distant future. A remedy should be applied that will be effective in a reasonable time. Reforestation is necessarily slow. To arrive at its full possible benefit, if benefit there be, will require fifty to one hundred years, or even longer.

The commission considers any of the three foregoing conclusions to be sufficient weight to justify rejection of reforestation as an element of flood control of the lower Mississippi river.

REFORESTATION NOT A FLOOD
CONTROL PROJECT*

The relation of forestry to the prevention of floods was discussed by Col. W. B. Greeley, Chief Forester of the United States Forest Service, in an address delivered in Chicago June 3, 1927. The subject has since been studied in a report prepared by the Forest Service under the direction of the Chief Forester, and access has been had to the report. It finds that a total area of about one hundred and fifty thousand square miles of forest land in the Mississippi valley is of such character that the protection of existing forests and the restoration of depleted forests would assist in preventing flashy run-off and would decrease erosion. Of this total area, about seventy five thousand square miles are reported to be in a condition detrimental to regularity of stream flow and stability of soil. It is stated that under adequate protection the mat of humus under the two hundred and fifty thousand square miles of forest land in the Mississippi watershed would absorb and retain an average of about one-half inch of rainfall more than under present conditions and that this would practically eliminate the silt such lands would otherwise contribute.

The report of the Forest Service points out that the immediate problem of flood control can be met with the required promptness only by engineering structures, and that activities to improve flood conditions by dealing with surface conditions and better land use must be considered as supplementary. This is in accordance with the statement made by Colonel Greeley at Chicago that "forests hold back flood discharges; but they cannot prevent large floods when heavy rains occur"; that forested land like any other reservoir "overflows after it has become fully saturated with rain"; that engineering

* Report of General Jadwin. *House Document no. 90. 70th Congress, 1st session. December 8, 1927. p. 18-19.*

structures must be "our main reliance . . . for controlling heavy flood discharges"; that forestry "has a valuable service to offer" flood control; that forests "can supplement dams or levees, but cannot take their place."

Practically all of the measures recommended in the report of the Forest Service as necessary steps in the direction of Mississippi flood control have previously been recommended by the Department of Agriculture as desirable on account of other economic benefits to be derived therefrom, such as a better timber supply, soil conservation, improved agricultural conditions, betterment of the livestock industry and protection of publicly owned grazing lands, prevention of stream pollution, increasing opportunities for outdoor recreation, and the protection of game and fish.

The report of the Forest Service recommends the acquisition of 8,500,000 acres or 12,500 square miles of land for forestation, at an estimated cost of \$42,700,000 together with measures for a greater degree of cooperation by the federal government in forest fire prevention and forest extension.

The report states that the returns from the forests, such as the sale of forest products will pay the entire cost and carrying charges, and claims that such incidental benefits as may accrue to flood control are an added asset.

Our public forests assist in conserving our timber supply, and are useful in preventing hillside erosion in areas subject to this damage, besides affording important recreational and scenic advantages to the public. They may have a useful local effect in reducing the torrential floods in mountains and hilly regions. A flood of the Mississippi is, however, not the torrential rush of water from denuded hillsides, but is the slowly rising long-continued outpour of the drainage from a vast region. Studies of the reservoir board have shown that, to reduce the flood stage of the Mississippi by one foot it is neces-

sary to store from seven million to eleven million acre-feet of water. The absorption and retention of one-half of an inch of rainfall on the eight million acres of land covered in the recommendation of the Forestry report, would therefore reduce flood stages by but one-half an inch.

In certain regions reforestation and the maintenance and improvement of existing forests, serve a useful purpose in checking soil erosion on hillsides, and in preventing thereby the choking of local streams by the silt washed down from eroding gullies. The silt carried by the Mississippi in its alluvial valley is not determined, however, by that contributed from the various lesser tributaries of its main branches, but is the balance remaining of the load which has been picked up and deposited many times over by the river in its course down through the alluvial soil of the river valleys. A single cave in the banks of the Mississippi will contribute more silt to the stream than the yearly inflow of silt from a lesser tributary. The stabilization of the river channels, proposed in the project herein recommended, should reduce this great source of river silting, and the stabilization of the channels in the tributaries in accordance with the projects for their improvement will have a further effect in this direction.

The checking of hillside erosion by forest cover in localities particularly subject to this loss will in the long run retard the extension of the river valley into the gulf, but the effect thereon of any reforestation or forest development within the bounds of practical accomplishment would apparently be insensible so far as present generations are concerned.

While therefore reforestation, like reservoir construction for local purposes is a step in the right direction, and will be beneficial in reducing erosion, it cannot be considered as a measure warranting inclusion in a com-

prehensive flood-control project for the alluvial valley of the Mississippi.

A FORESTER'S VIEW¹⁰

I take issue with the Mississippi River Commission and with the Chief of the Army Engineers, General Jadwin, with regard to the place of forestry in any comprehensive flood-control program. I wish first to call attention to the position taken by the commission. That part of the special flood report submitted by the Mississippi River Commission which deals with forestry as a factor in flood control constitutes a brief but amazing chapter to form part of a serious public document. After alleging that a careful study has been made of the possibility of obtaining flood relief from reforestation, the report states conclusions as follows:

- (a) That reforestation would not be efficacious.
- (b) That reforestation for flood control would be economically unsound.
- (c) That the remedy sought in reforestation would be too slow in effect.

The conclusions of the commission are erroneous, uninforming and are based upon a misconception of the facts. The commission states that a forest to arrive at the full benefits for flood control requires "fifty to one hundred years, or even longer." This is an absurdity. To produce high-grade saw logs does require fifty to one hundred years, or even longer, but the full benefits of forest planting in the form of stopping soil erosion are usually reached within five to ten years and full benefits in the form of water storage and stream-flow regulation are reached within ten to twenty years. The commission has already been working on this problem since its creation by Congress in 1879, a period of forty-eight years

¹⁰ Scott Leavitt. *Congressional Record*, 69:2481-3. (current file). February 2, 1928. Mr. Leavitt was in the United States Forestry Service for about ten years.

—a period nearly five times as long as that required to check erosion by reforestation and more than twice as long as the maximum period required to secure full benefits from forest planting in the form of water storage and stream-flow regulation. There is nothing to indicate that the other necessary engineering works will all be completed at a date earlier than the maximum twenty years required for a forest.

Equally absurd is the commission's claim that reforestation for flood control would be economically unsound. It states:

Even if it could be shown that reforestation would be beneficial in its effects on floods, it must be granted by its proponents that anything short of reforestation on a very large scale would not have a measurable effect on Mississippi river floods. Turning productive farm lands on such a large scale back to forests would be economically unsound.

Now, notice particularly that last statement from their report:

Turning productive farm lands on such a large scale back to forests would be economically unsound.

I wish to call the attention of the Congress to the fact that no one in official position in the Forest Service, no one in the profession of forestry anywhere, has ever suggested the turning back of one acre of agricultural land to forest land. This has never been suggested from any source, but this is only one of the false assumptions to which attention could be called in the report of the Mississippi River Commission. The report shows absolute ignorance and misconception when it comes to treating the subject of forestry in connection with this great program.

The Mississippi River Commission takes for its study two areas in the northern part of Minnesota. I am acquainted with them. One of them is an agricultural section and the other is a timbered section in the vicinity of Lake Superior. Their statement indicates an utter

lack of knowledge of the effect of forests upon stream flow. No foresters advocate "turning productive farm lands back to forests." Productive farm lands under cultivation and management, have a beneficial influence upon stream flow substantially equivalent to forest lands. They must have physical characteristics enabling them to take up a large part of the rainfall and utilize it in producing crops. Forests are most effective on steep land from which the rainfall otherwise would rush off, carrying with it the fertility of the top soil. Encouraging and protecting forests on such lands has a beneficial influence upon stream flow. It is the waste lands and lands which wash badly when denuded that contribute most largely to flood dangers and flood damage.

The report of the Forest Service, submitted to the House Flood Committee, indicates a total area of approximately two hundred and fifty thousand square miles of critical areas on the Mississippi watershed, embracing a total area of about one hundred and sixty million acres, or about 20 per cent of the total area of the Mississippi valley. These lands contribute a large share of the burden of half a billion tons of silt carried into the channel of the Mississippi river each year. This silt increases the volume of the flood as well as increasing its destructiveness. The reasoning followed by the commission and the evidence submitted in attempting to prove that forests would not be efficacious is naive, to say the least. It bases its conclusions upon certain data obtained by measurements of annual run-off from the two watersheds in northern Minnesota. One watershed is largely farm land; in other words, the very kind of land that should be cultivated and the kind that foresters understand, with proper cultivation and the growing of farm crops, is not detrimental from a flood-control standpoint. The other area was in the lumber regions of the lake district of Minnesota, a region which because of its level

topography, porous sandy soil and innumerable lakes, was classified by the Forest Service as a region within which forests had little influence upon stream-flow regulation.

The commission states that its records show that there was some increase in the percentage of run-off from this timbered watershed during the period of deforestation, followed by a gradual recovery, until the run-off from the area with growth of young timber was no greater than it was in the virgin forest period. But the commission failed to carry its calculations to their logical conclusion. An additional column should be added to the table found on page 74 of its special report. The efficacy of a watershed is determined not by the percentage of the total rainfall which appears as run-off, but by the actual number of inches of rainfall actually retained by the watershed and reconveyed to the air without running off. Take the table on page 74 and add to it a third column entitled "Average number of inches of water actually retained each year." Making this calculation based on the commission's own figures, the number of inches of rainfall actually retained each year by the watershed was as follows:

Period ending—	Inches
1891.....	20. 21
1898.....	20. 42
1905.....	19. 54
1912.....	18. 66
1919.....	18. 91
1926.....	18. 17

It will be seen from this that instead of there being the full recovery of the watershed, as reported by the commission, there has been a steady falling off in the actual amount of water retained by the watershed each year. The difference between the first seven-year period and the last seven-year period averages over two inches per annum. Applying this difference to the entire one hundred and twenty thousand square miles of

forest land in the upper Mississippi and the Ohio river drainage we get a total volume equivalent to 12,466,000 acre-feet. According to General Jadwin's report seven million to eleven million acre-feet of storage will reduce the flood stage of the Mississippi by one foot. By means of the vast potential storage thus indicated the flood crest might be reduced between one and two feet. Whether such a reduction would be important would depend upon how near the crest of the flood approached the top of the levees. At any rate, it can safely be said that the floods would certainly be diminished both in volume and destructiveness by preventing erosion. It is also certain that increasing the water-storage capacity of the forest would materially reduce the flood crest so that the run-off would take place during a longer period of time. And in addition to the claims made by the Forest Service the actual figures presented by the commission show a decided increase in the amount of moisture retained by virgin forests, which means, conversely, a decided decrease in the volume of run-off. Stated in its simplest terms, the influence of forests upon floods and run-off is that instead of a vast volume of muddy water rushing off in a brief period, the run-off is in the form of clear water of reasonably uniform flow. High levels are reduced, low-water stages increased. It seems in the interests of clear thinking and clear action upon our part, as a responsible body, that these facts should be known.

The Forest Service has not recommended to the Flood Committee that it specifically ask for the appropriation of a single dollar for flood control through forestry. It has urged upon the committee, however, that the proper protection of our forests and the intelligent application of sound forestry practice in the Mississippi valley would give to the threatened region a considerable measure of flood relief without any expense

being incurred directly for that purpose. The forests themselves will pay their way with timber and other products. I emphasize this statement. The Mississippi River Commission have begun by taking areas that no forester would take to prove the value of forest cover in flood control, and then they have disproved their own case with regard to that area, even though it could not fairly be taken as a characteristic area at all.

I am sorry I have not the time to discuss fully the report of the chief of Engineers of the Army, General Jadwin, but I think it is fair for Congress to expect that when a report is made upon which the opinion of Congress may be formed and upon which the opinion of the nation may be formed, it should contain only entire facts.

A study was made during the last year by the United States Forest Service in cooperation with the foresters of the various states in the Mississippi drainage, comprising about one hundred men trained in that kind of work. There were brought in certain recommendations as to what might be done, not to solve the problem of the Mississippi floods—and let me pause at this point and emphasize that again—no forester in official position or out has ever claimed that forestry would or could solve the problem of the Mississippi flood. No such claim has ever been made by anyone, but any informed forester knows, and many who are not foresters by profession know, from their own observation that a comprehensive reforestation of lands that are most suitable for the raising of forests, particularly on steep areas, will add materially to the control of flood waters in any drainage basin. The Chief Forester himself, Colonel Greeley, starts the statement he has made in connection with forests and floods, which was printed just this month, with these words:

Now that the Mississippi floods have awakened us to the need for the most complete insurance possible against the

recurrence of such catastrophes, it is essential that the true rôle of forests in flood control be recognized. Nothing will be gained by exaggerating the importance of that rôle. On the other hand, unless forests are permitted to play their part, much will be lost.

And Colonel Greeley closes his very comprehensive statement with these other words, that I wish to quote:

In order to get the maximum benefits of forest cover in the Mississippi basin it is essential that public ownership of forests, especially in the mountains and swamps, be greatly extended; that cooperation in forest fire protection between the federal government, the state and private owners be increased; and that the government and states give more assistance to farmers and timberland owners in forest planting and better forest management. Engineering works are a primary essential in flood control, but vigorous, well-kept forests will supplement and protect them. The two methods of control should be developed together, a river being treated as a unit from source to mouth. The prudent use of forest land, like the prudent use of farm and grazing land, pays its own way, and the gain to flood control is a by-product without cost.

That is the position of the foresters, and words of other meaning should not be put into their mouths.

The forestry report placed in the hands of General Jadwin stated eight ways whereby forest practice and control of public lands might add to the solution of this problem, and among those eight ways there are seven that could now be handled under laws which exist.

Seven of these in their order of importance are adequate protection against fire of the forest lands within the Mississippi river watershed; increased activities in the planting land chiefly valuable for growing timber; proper management of farm woodland; extension of public forests to the extent of about eight million acres within the watersheds; continued protection of national forests and the reservation of adjoining forest acres of unreserved public domain; research to discover methods of preventing serious erosion in the Bad Lands and the Breaks; checking present destructive run-offs and erosion from public grazing lands by regulating their use.

There is no law which would allow the latter procedure, but all the others are covered as possibilities by existing law and require only more adequate appropriations.

But the general, listing only the item to increase forest areas by eight million acres within the watersheds by extension of public forests, says on page 19 of his report:

Studies of the reservoir board have shown that to reduce the flood stage of the Mississippi by one foot it is necessary to store from seven million to eleven million acre-feet of water. The absorption and retention of one-half of an inch of rainfall on the eight million acres of land covered in the recommendation of the forestry report would therefore reduce flood stages by but one-half an inch.

General Jadwin has intimated that the forestry report comprises only the proposal to add eight million acres of public forest, which would reduce the flood crest only one-half inch, when the fact is the forestry report made eight proposals, and these eight proposals together cover not eight million acres of land but twenty times eight million acres of land. Taking the figures of General Jadwin himself and applying them to this entire area it would have reduced the crest of the flood ten inches instead of half an inch.

Also, in this report they have placed the forestry report as a suggested alternative. It has been suggested as an alternative. It has been suggested as a supplement to the engineering work, which the forester has always said is the prime necessity to meet the present situation, with forestry added to help keep disaster from recurring.

FLOOD CONTROL IN CONGRESS ¹¹

The greatest flood in our history now seems certain to be followed by one of the greatest oratorical outpourings ever heard in Congress. For the recommendations

¹¹ From *Literary Digest*. 95: 8-9. December 24, 1927.

of the President and the army engineers, particularly on the financial side, are calling forth loud objections from the congressmen, the editors and the other representatives of the Mississippi valley states. Only one thing may be considered as settled in advance, remarks the Boston *Transcript*, and that is that "the country is in for an enormous bill." The recommendations of Major-General Jadwin, Chief of army engineers, provide for spending \$296,400,000 on the lower regions of the Mississippi over a period of ten years. Of this sum \$185,400,000 is to be spent for flood-control works, with the federal government contributing 80 per cent, and the states affected 20 per cent; the other \$111,000,000 will be spent by the government alone on channel stabilization. The detailed plan has not been published in the press, but according to summaries it involves the abandonment of the "levee only" principle of flood-control and includes a spillway just above New Orleans emptying into Lake Pontchartrain, diversion floodways in the Atchafalaya and Tensas basins, a river-bank floodway from Cairo, Illinois, to New Madrid, Missouri, a certain amount of strengthening, raising and setting back of levees, and improvement and stabilization of navigation channels.

The merit of this plan, as seen by most editors, lies in its provision for protecting the lower Mississippi, while leaving the way open for more thorough-going projects after further investigation. It seems to the Washington *Post* that "all who sincerely seek to control the Mississippi, should stand solidly behind the plan." The practical nature of the program appeals to a number of our newspapers, among them the Louisville *Herald-Post* which points out that:

The floodways are an entirely new feature of Mississippi control. These are in effect channels parallel to the main channel. When the river rises to flood stage it will overflow into the floodways which will carry the water into the gulf. By this means the capacity of the stream is substantially increased. The spillway above New Orleans, a variation of a floodway, is also new.

It is the financial features of the plan that make most of the trouble. It will be remembered that in his message to Congress, President Coolidge pointed out that "under the present law the land adjacent to the dikes has paid one-third of the cost of their construction." He considers this an "extraordinary concession," since while the troublesome waters "do not originate on the land to be reclaimed," nevertheless, "such waters have a right of way through that section of the country and the land there is charged with that easement," and "it is the land of this region that is to be benefited." "To say that it is unable to bear any expense of reclamation is the same thing as saying that it is not worth reclaiming." These regions have paid out so much that President Coolidge thinks that the proportion they pay ought to be cut down, but he does not think the federal government should pay the whole bill. The President returns to this argument in his letter transmitting the Jadwin plan of flood-control, saying in part:

In determining the distribution of the costs, there must be considered not only the people of the valley itself, who receive the major portion of the benefits, but also the great mass of taxpayers who suffer less directly from Mississippi river floods, and upon whom most of the burden of federal taxation falls. It is axiomatic that states and other local authorities should supply all land and assume all pecuniary responsibility for damages that may result from the execution of the project.

The federal Treasury should bear the portion of the cost of engineering structures for flood-control that is justified by the national aspects of the problem and the national benefits. It may even bear 80 per cent of such costs, but substantial local cooperation is essential to avoid waste.

This arrangement seems "equitable and actually generous" to the *Washington Star*. The *New York Sun* scouts the idea that the federal government should carry all this expense as in the case of harbor improvements—

The two projects do not stand on the same footing. Federal authority over navigable waters is necessary unless the country is to abandon an essential part of the national defense. Flood-control will benefit the entire country incidentally, but primarily

it will benefit those who own bottom lands along the rivers, much of which is worthless without flood-control and extremely valuable with it.

But the voice of the lower Mississippi valley states is raised in loud protest. Their general opinion is set forth by George N. Coad in a New Orleans dispatch to the *New York Times*:

These states cannot make any substantial contribution toward adequate works for the control of floods. All they can do they have done. If the enormously expensive works now generally admitted to be necessary to prevent repetition of last spring's disaster are to be constructed, the federal government must bear the burden.

This is not merely the opinion of those who would make a habit of saddling every expense upon the federal Treasury, nor of half-informed persons eager to make out a case. It is the opinion of all thoughtful men, bankers, engineers, editors, merchants, of this section of the valley. They know that spillways and improved levees are going to cost many scores of millions of dollars, and they know that most of the levee districts of these states could not raise a substantial proportion of this sum if their very existence depended upon doing so. This country has gone to the limit of its endurance in fighting the river. Its burden must be eased.

Control of streams like the Mississippi is an obligation that rests solely on the federal government, argues the St. Louis *Globe-Democrat*, a leading newspaper of that region:

Its purpose is to protect life and property from the ravages of streams over which the government is charged with responsibility. It is a work of defense. Moreover, experience has shown that division of costs is impracticable. The work of flood protection on these rivers, which form a national system of waterways, should be entirely in the hands of one power, endowed with the authority and the means to accomplish it effectively; and the federal government is not only the sole power capable of such accomplishment, but the paramount obligation rests squarely upon it to take full charge of the work.

The Natchez *Democrat*, a little farther south, declares that the proposal to have the flood-stricken areas pay a proportion of the cost of control is "impossible and impracticable"—"the people of the flood-stricken areas are

in need of bread, and it will not suffice to feed them a stone." The New Orleans *States* insists that reclamation has nothing to do with the problem, that the lands in the valley have been highly developed for generations. And when the President says an easement exists for the drainage of the whole valley, "he seems to forget that, while this may be true, the demand on this easement has grown out of all proportion to what it was originally by the cutting down of the forests and the extraordinary development of the thirty states through which the waters now come in floods infinitely greater than say half a century ago." Wherefore, it is said to be only simple justice that the government should take over flood-control and harness the Mississippi. Another New Orleans paper, *The Times-Picayune*, declares that "the states of the lower valley have already spent more than enough money to protect themselves from any possible flood that might originate within their borders." But while the Memphis *Commercial Appeal* voices its great disappointment that the administration declines to assume the entire cost, it adds that:

The reduction of the percentage of cost from one-third to one-fifth may inspire a new effort and a new resolution. The valley will assume the burden, if possible. If not, it must face the prospect of future floods until the government is wise enough to assume the entire cost or until conditions are so improved that it can pay the part allotted to it.

BRIEF EXCERPTS

In this country there are about 287 rivers which are classed as navigable.—*Raphael Zon. American Forests and Forest Life*. 33:388. July, 1927.

Reforestation is not a practicable means for the present relief from floods.—*John W. Alvord and Charles B. Burdick. Relief from Floods*. p. 27.

The 1927 flood is not the largest that can form in the Mississippi valley, nor was the damage done the greatest the river can do.—*Walter Parker. National Real Estate Journal. 29: 48. January 23, 1928.*

Any benefits derived from reforestation cannot be secured overnight. They come about only through a long space of time.—*W. B. Greeley, Chief, United States Forest Service. American Forests and Forest Life. 33: 409. July, 1927.*

The sympathy of the nation should go out to the poor people of the Mississippi valley, where an avalanche of water 300 miles in length and 100 miles in width covered every city, village and farm.—*William E. Hull. Speech in Congress. January 31, 1928.*

From the day when Thomas Jefferson consummated by treaty the Louisiana purchase, the flood control of the Mississippi river and its principal tributaries has been a problem of the first magnitude.—*L. C. Speers. Nation's Business. 15: 42. November, 1927.*

Almost a year ago a great disaster visited our country. It involved the loss of some 200 lives, it made homeless 700,000 people, it destroyed over \$250,000,000 worth of property.—*Harry B. Hawes. Congressional Record. (current file). March 9, 1928.*

The Mississippi watershed embraces 1,250,000 square miles, about 41 per cent of the total area of continental United States. Its watershed embraces 31 states and 2 provinces of Canada.—*Harry B. Hawes. Congressional Record. (current file). March 9, 1928.*

Changing forest areas into cultivated fields had no appreciable effect on the flow of the Ohio river during

a period of thirty-eight years [1871-1908].—*Willis L. Moore. Former Chief, United States Weather Bureau. American Mercury.* 11:261. July, 1927.

The Mississippi valley contains the most fertile soil and is perhaps the most productive area in the entire United States. The lands lying in the flooded districts constitute the bread basket and the sugar bowl of America.—*Len Small. House Hearings,* 1927. p. 8.

As the bottled up waters climbed higher and higher, the levee lines broke or were overtopped and washed down in some 251 places, with accompanying loss of life and property on an enormous scale.—*Walter Parker. National Real Estate Journal.* 29:47. January 23, 1928.

It would be useless to pass legislation to take care of the flood waters of the Mississippi river without passing equal legislation to take care of the tributaries, because it was the tributaries that created the greater part of the late flood.—*William E. Hull. Speech in Congress.* January 31, 1928.

Very soon after a heavy rainfall and often during the precipitation which may precede it, the forest floor becomes so completely saturated with water that it allows any further rain to pass off, just as it would from open ground.—*Raphael Zon. American Forests and Forest Life.* 33:387-8. July, 1927.

It is necessary to look upon this emergency as a national disaster. It has been so treated from its inception. Our whole people have provided with great generosity for its relief. Most of the departments of the federal government have been engaged in the same effort. *President Coolidge. Message to Congress.* December 6, 1927. p. 12.

It has been stated by an expert that the flood of 1927 below Vicksburg surpassed any previous one that had occurred in something like 200 years, and a second 200 years or even more might elapse before the appearance of a flood that will be as great or greater.—*Report of General Jadwin. House Document no. 90. 70th Congress, 1st Session. 1927. p. 13.*

When the rainfall is heavy and continuous, as it must be to cause noteworthy floods, there is practically no difference in the flow of water in the forest and in the open, for it can be shown that the run-off from a smooth surface and a rough one covered with debris is equal after the rough surface becomes well wetted.—*Willis L. Moore. American Mercury. 11:262. July, 1927.*

Given the money necessary, there is a solution for every engineering problem, and no matter what the cost of flood control, it will not be nearly so much as the loss suffered as the result of this flood, which has devastated so many hundreds of thousands of acres of the most fertile land on earth and rendered hundreds of thousands of good citizens homeless and destitute.—*L. C. Speers. New York Times. May 22, 1927.*

The swift run-off that follows forest destruction raises the flood level with silt, gravel and bowlders. It also raises the flood level with an excess burden of water that would under normal conditions be absorbed into the ground. The reduction of this surplus burden of silt and water is a prime objective of flood control.—*Ward Shepard. Forests and Floods: Circular no. 19. United States Department of Agriculture. January, 1928. p. 10.*

The destruction of the pine forests in Wisconsin has had no effect whatever in creating or increasing floods

and drouths in tributary streams, or in the upper Mississippi, inasmuch as these features are controlled by precipitation which has not increased or decreased to any marked extent, at least not during the periods of accurate observations made by the weather bureau. The high waters are not higher, nor the low waters lower than formerly, nor are they of greater frequency and duration.—*C. W. Durham. Engineering News. 69:1012. June 23, 1913.*

Civilized man cut out the forests over the watershed of the tributaries, drained source stream lakes and low places, destroyed head water reservoirs, and by his every act of development hastened the flood drainage run-off, which, from 41 per cent of the United States, must find its way to the sea down the Mississippi. Then he built levees along the channel banks of the Mississippi. He kept this up until 27,000 square miles of the 30,000 square miles of natural lowland reservoirs had been taken from the river. In every great flood some of his levees would break. But he was told they broke because they were not high and wide enough; to build them higher and wider and all would be well.—*Walter Parker. National Real Estate Journal. 29:47. January 23, 1928.*

Deforestation of the basin [of the Merrimac river] continued progressively from the earliest settlements until about 1860 to 1870, and since that period forested areas have increased through natural causes by 25 per cent or more of the entire basin, notwithstanding the continuance of lumbering operations. There has been no decrease in precipitation in the basin as a result of deforestation, or any increase with the reforestation of 25 per cent or more of its area. The average run-off through the river varies with the precipitation over its basin, and the percentage of run-off to precipitation is not appreciably affected by forest changes as great as 25 per cent

or more of the basin. The frequency of floods has not been decreased by forestation, nor increased by deforestation. Exceptionally high floods have occurred at intervals without respect to forest conditions.—*Edward Burr. Document no. 9. 62d Congress.*

If the growing of vegetation on a water-shed actually conserves the moisture in the soil and protects it from loss, then every orchardist, instead of cultivating the spaces between the rows of his trees, should allow these spaces to grow up and be covered with bushes, weed and grass. But the man who is growing fruit listens to the voice of science instead of paying heed to the hysterical screams of interested office-holders. These office-holders wish only to retain their jobs of protecting worthless vegetation. They hope so to alarm honest people with forebodings of impending disaster that large grants of public money will be forthcoming to increase their personal emoluments and hire additional defenders. Many Americans, deceived by this propaganda, believe that unless vast areas are returned to forest conditions that part of the North American continent occupied by this United States will suffer floods and droughts of increasing intensity. But those who have spent their lives in the study of the science of the atmosphere do not believe this.—*Willis L. Moore. American Mercury. 11: 257-8. July, 1927.*

The Mississippi valley experienced great overflows of water before its forests had been touched by an ax. Forests cannot prevent floods in the face of heavy, long-continued rains or the rapid melting of masses of snow. But forests, well-sodded pastures and terraced fields hold back more of the falling water and more of the soil than denuded woodlands, overgrazed hillsides, or eroded farms. This helpful influence can seldom be separated from the other factors affecting the flow of

a stream so that it can be measured by itself in exact terms. It may be greater or less on a particular watershed, by reason of the soil, topography or climate, but when exerted on all the watersheds of a great river basin it is enormous. Forests are better binders of the soil and better surface reservoirs of water than any other form of vegetation on the face of the earth; and the 160,000,000 acres of actual or potential forest land drainage into the Mississippi have a real service to render in helping to protect the valley from destructive floods.—*William B. Greeley, Chief, United States Forest Service. Floods and Forests: Circular no. 19. United States Department of Agriculture. January, 1928. p. 1-2.*

What it all means in human terms is simple enough, 750,000 people flooded, 600,000 driven from their homes or made dependent upon relief. No one can at present calculate accurately the economic loss. It will probably run from \$200,000,000 to \$400,000,000. That 1,500,000 of our countrymen should continue to live in such jeopardy is unthinkable, nor can the nation afford to abandon to disease-producing mosquito swamps 20,000,000 acres of its richest lands, an area nearly as large as the state of Indiana. This flood has been the greatest disaster of peace times in our history, but what will it be if we have 10,000,000 of our people living in such jeopardy instead of 1,500,000? All the engineering plans for flood control of the river must, of course, be revised in the light of their experience, and they must be revised as against any combination of floods from the tributaries. The main thing is a plan bold and strong enough to deal with the question in finality, for we have to live with this river for thousands of years yet. I am convinced that our engineers can develop plans which will control the floods. I believe we can give security to the people living below the levees that will permit the full development of

these plans and their full growth in population.—*Statement by Herbert Hoover. Washington Star. June 12, 1927.*

The recent great flood in the Hudson river at Troy was after all less in volume and in flood height than the flood recorded in the same river in February, 1857. But nearly all the waters of the Hudson river above its junctions with the Mohawk come from the Adirondack region, which in 1857 had hardly been touched by lumbermen. The Adirondack plateau contains an extraordinary number of natural reservoirs in the form of lakes and ponds, and great areas of swamp and comparatively level land. If the theorists who ascribe the present day floods to the removal of the forest and the drainage of the swamps were correct, then the drainage area of the Hudson in 1857 could not possibly have produced such a record-breaking flood. It will doubtless be admitted that if the removal of the forest and its mulch covering the soil has had no part in producing great floods, then no changes brought about through the cultivation of the soil, the building of roads or cities, or the drainage of swamps has had any more effect. The highest water ever recorded in the Mississippi river at St. Louis was in 1844 and the next highest in 1785. At the later of these dates as well as the earlier, the entire territory drained by the upper Mississippi and Missouri was practically untouched by man and in a state of nature.—*Editorial. Engineering News. 69:916. May 1, 1913.*

I heard Dwight F. Davis, Secretary of War, at the recent flood control meeting in Chicago, point out with clearness and cogency that we must not act too hastily with regard to the Mississippi, that what we need first of all is a plan. He assumed that the Corps of Engineers of the United States Army would make that plan. We

have been dealing with the Mississippi river for half a century, but, when a great emergency arises on that river, Secretary Davis tells the country it must prepare a plan. That would not be necessary if it had a plan now. The worst enemy of the Corps could not formulate a more destructive charge against its efficiency in the regulation of the Mississippi. Unless my dates are wrong, the Corps of Engineers of the United States Army has had charge of the river since 1879. I do not forget that the Mississippi River Commission is nominally in charge. But that commission is mainly composed of and entirely dominated by the army engineers. From 1879 to 1927 is forty-eight years. Forty-eight years is practically a half century. At the end of that half century of control work by the army engineers comes the worst and most costly flood that we know anything about. And more than that, the Corps of Engineers after half a century of acting and responsible dealing with the river, does not know what to do next, is without a plan for its control.—*Gifford Pinchot. Survey. 58:367. July 1, 1927.*

The main work of the present season has been caused by the Mississippi flood. While high water in this basin has been of constant recurrence, the rise this year was 2 or 3 feet above any other record from Cairo to the Gulf of Mexico, a distance of over a thousand miles. Dikes were broken down in 226 places, submerging over 20,000 square miles, involving 174 counties in parts of 7 states. The means of communication were entirely interrupted, much livestock was destroyed, and homes of more than 700,000 persons were flooded. It is estimated that about 250 people were drowned.

Over 600,000 people have been dependent on the Red Cross for food, clothing and medical assistance. While nearly 280,000 insisted upon remaining in their waterlogged homes, where the task of caring for them was

tremendous, 330,000 were transferred to the Red Cross refugee camps, one of which contained as many as 20,000 persons.

When the floods receded the refugees were returned to their homes. Then began the no less important work of rehabilitation and reconstruction, with specially constituted state commissions to work in cooperation with the Red Cross. This included furnishing shelter and household goods where necessary, repairs to buildings, livestock, agricultural implements and seeds. Out of a crop acreage of about 4,500,000 which was flooded, 1,622,000 acres have been replanted through the assistance of the Red Cross. The crops include cotton, corn, oats, soy beans, peas, wheat, sweet potatoes, alfalfa and garden truck. Over 100,000 families have been rehabilitated. Now, all except 8 per cent of the people affected are able to provide for themselves. *President Coolidge. Address at the Annual Meeting of the American Red Cross. October 3, 1927.*

The following table shows the proportions of the cost of levees actually borne in the past by the federal government and local authorities:

Amounts expended by the United States government in the construction of levees and the amounts expended by states, levee districts and communities interested, from 1882 to December 31, 1926, covering cost of yardage placed, rights of way, interest, engineering expenses, repair work, high-water expenses, crevasse closing, etc.

Mississippi River Commission Districts	Expended by United States from government funds	Expended by United States from contributed funds	Expended by state and local organizations	Total
Northern ..	\$3,127,533.49	\$1,083,857.69	\$9,916,110.91	\$14,127,502.09
First and second ..	19,796,161.78	4,348,420.82	42,766,497.05	66,911,079.65
Third	27,614,208.84	5,852,103.37	34,782,460.96	68,248,773.17
Fourth	20,552,089.47	3,773,898.32	64,488,106.33	88,814,094.12
Total	71,089,993.58	15,058,280.20	151,953,175.25	238,101,449.03
Per cent.	30	7	63	

In addition to meeting the costs shown in the table, the inhabitants of the valley have been subject to recur-

ring flood damage. The direct damages suffered from the 1927 flood are estimated by the Mississippi flood Association to have been \$236,334,414.06. The table clearly shows that the people of the valley have borne much the greater part of the cost of flood protection, although the United States has given substantial aid. The local participation has furthered the keen interest of each locality in the proper execution of the work. It has afforded a check on pressure for the execution of works not economically justified. The division of cost has led to some division of control. The enlargement of levees affecting large areas has been delayed, in some cases, by the failure of a levee district to furnish its share of the cost. It is doubtful whether these disadvantages have counterbalanced the advantage of a local proprietary interest in the works.—*Report of General Jadwin. House Document no. 90. 70th Congress, 1st Session. 1927. p. 10.*

AFFIRMATIVE DISCUSSION

THE NATION'S PROBLEM¹

Almost fifty years ago the federal government became actively engaged in Mississippi river work through the Mississippi River Commission. The repetition of floods since that time has impressed more and more strongly upon business interests of the country and the general public the national character of this flood control. This statement is supported by the following quotations from *Bradstreets* published April 17, 1897, exactly thirty years previous to the recent flood:

The attention which the subject of Mississippi river overflow is receiving at present is certainly not out of proportion to the vast interests, both human and financial, which are involved, and it seems encouraging to note the practical agreement that whatever is to be done, whether in the strengthening of the present levees or the devising of new and more efficacious plans of controlling the river, should be under national direction.

The committee has been impressed with the insistent demand throughout the nation that the recent flood should not go the way of other floods and be merely recorded in history as "the record flood of 1927," but that it should be remembered as the flood which aroused the nation to its sense of responsibility and directed the forces which will ultimately prevent a repetition. Our present wealth, our increasing national solidarity, the interdependence of various sections of the country, the increasing importance of our great arteries of commerce—our rivers, railroads and highways; our ability to construct great public works with the highest engineering

¹ *Report of the Committee of the Chamber of Commerce of the United States. Referendum no. 51. p. 6-22.*

skill and our quickened national consciousness—all call for the removal of this flood menace.

The history of the last twenty-five years has illustrated the fact that we, as a nation, have come only slowly to grasp the magnitude of this flood menace. Rather tardily, it must be admitted, have we come to see that it is something beyond the capacity of the states immediately affected, and the concern of the nation as a whole. As recently as 1917, the federal Congress appropriated \$45,000,000, which was expected, with the addition of approximately equal expenditures by the local interests, to complete the system adequately. However, only six years thereafter, a further sum of \$60,000,000 was appropriated in the expectation of completing this big undertaking. Now we learn that the floods of 1922 and 1927 largely wiped out the expenditures to date, and today we are face to face with the fact that we have either spent too little or too much—too little if we are to do this work effectively, too much if we are doing any less.

The committee would be glad if it could give an adequate picture of the force and extent of the flood, but to do so is not possible. Nothing short of actual experience with the waters themselves could give this. The committee traveled for days through regions where every house bore at a height of from two to ten feet the brown line, indicating the height of the water. Where the flood was at its worst, houses were destroyed or carried miles from their foundations. The committee saw millions of acres of rich alluvial soil covered with a mass of cockle burrs, man-high, where before there had been profitable crops. The total estimated area flooded is equal to the combined area of the states of Massachusetts, Connecticut, Rhode Island, Delaware and Maryland. The quantity of water which poured through this valley was the equivalent of ten streams the size of Niagara flowing for a period of four weeks.

The statement was made in one of the addresses that at one point in Louisiana it would have been possible to cruise in a motor boat for two days out of sight of land.

What the committee saw was striking evidence of the fact that the Mississippi river drains 42 per cent of the entire area of the United States—an area in which occurs some of the heaviest rainfall—rainfall that over extensive areas sometimes equals two feet in less than two weeks.

The work of rehabilitation has gone on rapidly. Roads have been made passable, bridges have been replaced with temporary structures, and to some degree some kind of crop has been produced over much of the land that was flooded. The committee saw places where there had been three, four, or five floods during the year; but notwithstanding this the people desired to remain on the soil and “come back” as agriculturists. They have confidence in the future of this region.

Determination of the practicability of flood control received the committee's fullest consideration; for on such practicability must rest the whole program of flood control.

The committee considered the periods of flood occurrence, their extent, the factors that cause floods, probable maximum floods that must be provided for, and river characteristics. Tables, charts and tabulations dealing with these subjects are presented in the appendice. The oft repeated statement that the effect of the levee system has been to raise the bed of the river itself has been carefully checked and found to be unsupported by the evidence for on this point, the committee is assured by those who have been making observations and studies over a long period of years that such is not the case.

Types of flood control, such as levees, spillways, bypasses, outlets, and combinations of these different methods, have been considered, together with other plans

for control, including reservoirs and reforestation on the headwaters of tributaries.

The committee has not attempted to develop a plan of its own, but has directed its attention to determining whether it is practicable to control floods at reasonable cost by a system of levees, spillways, outlets, etc. After listening to many of these proposals and securing the judgment of the highest engineering talent in the country, both governmental and civilian—federal, state and local—the committee is impressed with the unanimity of opinion that adequate control of the Mississippi river is practicable.

The extent to which reservoirs, reforestation, etc., on the tributaries and headwaters would assist in the control of floods in the lower Mississippi is a controverted question. The committee, after considering this, came to the conclusion that, even if such measures should prove helpful, not only would their accomplishment require many years, but they should be considered as supplemental aids contributing an additional factor of safety in the future control of floods.

In seeking the reason for failure to control floods thus far, the committee has traced the history of development of government policy, both local, state and federal, in the construction of levees along the Mississippi river. It has traced this development from private levees erected at individual expense of the plantation owners to the formation of levee districts, and finally to cooperative building by the federal government and local levee districts.

When levee construction began at New Orleans, in 1717, small earthen dikes of from four to six feet in height were all that were necessary to afford protection from floods. With the general development of the country and the action of other regions to protect themselves from floods, the vast areas which previously had afforded storage for the river were removed, and the history of

the river shows a constantly increasing height of river flood crest. During this period the nation has progressed from a sparsely settled territory to one thickly populated with prosperous cities, covered with a web of railroads, public highways, and telegraph, telephone and power lines. The day has passed when the river can be permitted to overflow its banks, disrupt the commerce of the nation, and bring vast human suffering and economic loss to the flooded area. The immediate loss to the areas affected is not a determining factor; for, while an important factor, it is only part of the general derangement to the commercial life of the nation—directly by the interruption of commerce, and indirectly by the economic loss which falls on every citizen.

Unfortunately this demand for flood control, calling for higher levees and for other methods of flood control in the interest, not alone of the affected areas, but of the nation as a whole, has outstripped the ability of the flooded areas to pay. The history of the levee districts shows that in some instances districts have taxed themselves beyond their ability to pay. While some regions are better able to pay than others, a proper system of flood control is exactly like a chain, no stronger than its weakest link. Of the twenty-nine levee districts stretching from Cairo to the gulf, many have reached their full legal tax limit. Many not only cannot pay further sums for the greatly increased expense required but cannot pay their existing obligations save at great sacrifice.

Thus far the total expenditures since 1882 of all agencies in the construction of levees amount to \$225,000,000; whereas the federal government has expended directly for similar work \$65,000,000. The local agencies have expended nearly three dollars to every dollar spent by the federal government.

The investigations of the committee revealed the following reasons why the federal government should bear

the entire cost of construction. The problem of flood control is national, particularly because it involves directly or indirectly the flow of commerce, north and south and east and west, in the very heart of the nation. The federal government is authorized under the provisions of the federal Constitution to deal adequately with a problem so vital to commerce. Moreover, national defense requires the federal government to see that the nation may not be subject to the derangement of transportation and of the general destructive effects of floods upon the nation in time of war. One speaker asked the question, "What would have been the effect upon the efforts of the United States if the flood had come at the height of our activities in the World war?" and he asked further, "What would be the effect upon the nation if such a flood should happen when we were in a desperate struggle with foreign invaders?" During the recent flood, operation was suspended from ten to one hundred and twenty days on three thousand miles of railroad.

The principle that the federal government carries a responsibility for control of floods of the lower Mississippi was recognized in the Mississippi River Commission Act of 1879, which set up that commission and provided funds for work on the Mississippi river. The condition of expecting the local districts to carry the major part of flood control work persisted, however, and the amounts spent by the federal government between 1879 and 1917 for flood control are as follows: federal government, approximately \$23,000,000; local levee districts approximately \$143,000,000. In 1917, however, the federal government took a long step toward accepting full responsibility for controlling floods and assumed two-thirds of the construction costs of control works, the other one-third of construction costs and rights of way and maintenance being left to local districts. Under the Flood Control Act of 1917, and the further legislation of 1923, the federal government has appro-

appropriated in the last ten years over \$86,000,000 for flood control works whereas local levee boards have spent about \$17,000,000.

The history of the relationship between the federal government and the local districts indicates clearly a growing appreciation of the need of sole federal responsibility. Levee districts and bordering states should not be called on to pay all or part of works that are clearly a national responsibility. Such a principle is seldom applied to harbor works, locks or dams, or in many instances to highways, which are constructed under the commerce clause of the Constitution. It is just as fallacious to attempt to protect the heart of our country from floods by placing the duties both financial and protective upon the bordering districts as it would be to place the protection of our national boundary upon the boundary and coast states, or to call upon the ports of our nation to stand the expense of their navigation improvements.

The committee found that the present arrangement, which calls for local contributions and maintenance, results in a divided responsibility, and is destructive of success in planning, constructing and maintaining the works necessary for flood control. The federal government in assuming its responsibility for the development of adequate flood control works should not have to deal with the local influences which grow out of this contribution system. Finally, in the words of one member of the committee, "It is a condition and not a theory" which confronts the nation in dealing with this flood control problem. Many of the levee districts are unable to do their part in maintaining the system as it exists today, a system which is obviously inadequate. Clearly they cannot furnish greater contributions to the enlarged program of construction which now faces the nation. The entire project cannot be permitted to lag because of the inability of any of the units to contribute.

The committee has had before it proposals that the

federal government should enter into agreements with the affected districts looking to contributions in later years. Precedent is against this principle as applied to works of a national character, and we believe it to be unsound.

In view of the universal demand for unified control and undivided responsibility in meeting this national problem for flood control on the Mississippi river, the local and state governments should not be called upon for further contributions, which, in view of the enlarged expenditures required, would be a small proportion of the whole, and would tend to interfere with the proper discharge of the federal government of its obligations to deal effectively with this problem in a national way. We therefore recommend that,

The federal government should hereafter pay the entire cost of constructing and maintaining works necessary to control floods of the lower Mississippi river. (For the purpose of this report, lower Mississippi means from Cairo to the gulf.)

The federal government should assume the sole responsibility for locating, constructing and maintaining such works.

As a result of its studies the committee is forced to conclude that the reason why the Mississippi river is still uncontrolled is a weak financial plan and inadequate and divided administration, and not inability of the nation's engineers to develop adequate plans. Unfortunately thus far the problem put up to the engineers has not been, "What levee will you build to safeguard the country behind it, and what will it cost?" The engineer has been given a certain sum of money to be expended in a given district and told to make it go as far as possible.

That any plan of flood protection which may be adopted may be carried forward in the most economic and efficient manner, the rate at which appropriations may be expected must be definite. The first years of

carrying into effect the project finally adopted will naturally call for sums less than in the later years when the organization has been fully perfected. Statements unfortunately have been made that enormous sums of money will be required immediately to deal with this project. Undoubtedly in the aggregate large sums will be required, but expenditures must necessarily be spread over a period of years, and certainly the amounts required for construction during the next year or two will in no way cast a burden upon the Treasury or interfere with the government's fiscal policies.

Inadequate appropriations in the past have materially delayed the carrying out of a systematic plan of protection. They are sufficient reason for insisting upon a proper financial scheme at this time. What the final cost of the project now being designed by the Mississippi River Commission and the army engineers will be, can be only approximated at this time. The cost of this plan, or some modification, is not an issue. Competent authorities assure us, and we confidently believe, that the expense, though large, is one the nation can well afford to pay. Possible variations in the total figures are unimportant. The job must be done. It must be done as rapidly as the organizations for doing it and the detailed plans for the work can be perfected, after the project itself has once received national approval.

The necessary money must be available as needed. Conditions in the past may have justified the course which the federal government has pursued. On this point no comment need be made. We must accept the past as it is and profit by the experience gained. To permit this periodical destruction to continue, would be not only an indictment of our patriotism and wisdom, but an unescapable indication that we are unwilling to use our present vast national wealth and our administrative and engineering ability to remove this menace from the

heart of our country. We, therefore, recommend that, *there should be an adequate appropriation to insure efficient, continuous and economic work, the funds to be made available as needed.*

In attacking this great national problem in which the federal government is to assume sole responsibility for its solution and is to pay the entire cost of the project, the project itself must be definitely conceived and set apart from all other domestic problems. It must be singled out and the solution considered and financed free from any relationship with other national or local problems. This is necessary because of the nation's interest in a complete and permanent solution. Such a solution can have nothing less than the support of the whole country. It must have particularly the support and judgment of all business interests. These cannot be divided, nor can they be considered in any way as related to similar developments elsewhere. This nation built the Panama canal under just such circumstances, and in some respects this project is a more important one than building the Panama canal. That project was a definite and entirely separate undertaking by the federal government. In such manner should the government attack the problem of flood control in the Mississippi river. It must not be entangled with any local conditions or limitations, financial, physical or political. Neither should it be tied in with internal developments elsewhere within the country. The control of the Mississippi river floods is now more than ever before our greatest domestic problem. Legislation should deal with it singly and free from other projects.

The committee had presented to it suggestions for extending flood control to tributaries of the lower Mississippi river and it has considered plans on a much larger basis involving the entire Mississippi river watershed; but it has always been forced to return to the im-

portant problem facing the main-trunk system of the lower Mississippi river. So long as the system of flood prevention in the lower region remains incomplete, this region requires first attention. The government is already prosecuting a study of the problems of tributary streams under an appropriation by Congress made for that purpose. The committee, therefore, makes no recommendation on this subject, pending that investigation.

We have recommended that sole responsibility for constructing the works to control floods be placed upon the federal government and the payment of the entire cost by the federal government in order to fortify this responsibility. It is equally important that the plan of administration should be centralized. As stated before, the project is likely to be more extensive than the Panama canal and we may well take a leaf from the nation's experience with that great project. There should be a carefully formed organization adapted to carry on and complete a project of such proportions, vested with ample power for the necessary research by way of preparation for the adoption of its plans, and for carrying out the work, and with full discretion in all matters of engineering, operation and maintenance. We, therefore, recommend that, *flood control of the Mississippi river is a work of such magnitude and urgency that it should be dealt with in legislation and administration upon its own merits, separate and distinct from any other undertaking.*

THE NATION'S DRAINAGE²

In introducing in the House today a bill for the control of the destructive floods of the Mississippi river, I have in mind the distinct purpose of providing Congress

² Statement of Frank R. Reid, chairman of the Committee on Flood Control in regard to H.R. 8219, a bill to prevent destructive floods, etc. *House Committee Document no. 7. 70th Congress, 1st Session. December 21, 1917.*

and the American people with my conclusions upon the most important problem which this Congress, in my opinion, will be asked to solve, a problem affecting not only the lives and happiness of millions of American citizens, but the very welfare of the nation itself.

My views differ from those embodied in the reports submitted to Congress only as to the question of the government's policy regarding the payment for the flood-control works, which is a question exclusively for the determination of Congress, but upon the correct decision of which depends whether or not Congress really wants and intends that disastrous floods like that of 1927 shall never occur again, or whether only a gesture is intended.

The 1927 flood has been described as America's greatest peace-time disaster. It was a terrific blow at the national prosperity. It cost many lives, destroyed hundreds of millions of dollars of property, suspended for weeks interstate commerce, delayed the mails, paralyzed industry in many states, and had a material effect on the business of the whole nation.

When the flood was at its height I visited the devastated regions and when it had receded I returned to get at first-hand impressions of how the people had recovered and what must be done to prevent a recurrence of such a calamity. On foot, in airplane and automobile and by boat and train, I went over practically all the inundated area. The conclusion which has been forced upon me is that the United States government alone can prevent a recurrence of such a disaster.

The protection of life and property and the safe conduct of interstate commerce, as well as the protection of the mails is the solemn obligation and duty of the government of the United States, and that was the underlying thought in the preparation of this bill.

There is in the bill no provision for local contribution. There can be none if Congress intends to protect

the lives and property of its citizens from these destructive floods. The elemental weakness of the present system, as disclosed by investigations and reports made by the government agencies, is that the dependence upon local participation has resulted in a weak and unfinished system of levees. I waive the equation of justice entirely and disregard the statement substantiated by incontrovertible proof, that these people have been bled white in paying the bill of the nation's drainage, and that prostrate and in ruin they are unable to pay any longer. Whatever sentimental impressions such argument may force upon one, and however much injustice is involved in compelling a small section of the nation to bear the nation's entire burden, I have not considered that in writing the present bill; but it is unthinkable that any student of our government will assume that the United States in the discharge of the purely national governmental function of protecting the lives and property of its citizens from destructive flood waters of navigable rivers and promoting the interstate commerce of this nation, should demand of local communities a part payment of the cost.

There is but one governmental theory under which an argument for local participation would be justified, and that is by classing this as a reclamation project, but to do so would be to deny the whole history of the lower Mississippi valley where for hundreds of years thousands of acres of fertile lands have been under cultivation. These flood-protection works are not intended or designed to bring a single uncultivated acre of land under cultivation. They are not designed to add a foot to the already cultivated area; as a matter of fact their immediate execution will take out of cultivation some land. They are intended as a protection to the lives and property of those now living there, a protection which the government owes these citizens from the mad

waters of its interstate streams. Hundreds of cities, towns and villages lie along the banks of the river. These cities have been prosperous except in times of flood for more than a hundred years. Thousands of miles of railroad have been constructed and huge investments in factories and agricultural plants are located in the valley. Certainly these are not to be reclaimed, but it is the government's duty to protect them from destruction by floods. To reclaim land is to convert into usefulness land not at that time useful. The section with which we are dealing has been a wealth-producing section of this nation for more than a hundred years, and it is threatened now with absolute destruction unless the government steps in to control the flood waters of its main river.

My visit to the stricken areas has convinced me that what the people of the Mississippi valley need in their cities and farms is protection of their lives and property while they are pursuing their ordinary walks of life. One thing they do not need is to reclaim land from the swamp or overflow areas for agricultural purposes, as many farms adequately protected by levees and free from overflow have been abandoned on account of the general slump in the prices of farm products in this section, the same as in other parts of the United States.

Reclamation of land is a luxury and should only be permitted where the people voluntarily ask for it and where it is economically justified. No person in the South is asking that reclamation be a part of any flood-control project, and to make flood protection dependent on reclamation is to deny that protection. No levee system can be effective unless it is unified, coordinated and complete, and should any levee district fail to pay a contribution necessary under the reclamation theory the whole plan would fail.

Nearly every levee district is now or will soon be bankrupt. There is no possible way for them to get

money as they are unable to sell any bonds because of the default in the bonds already issued.

Comment is made that the people of the valley should be glad to pay a small amount if a large amount is spent by the government to benefit their land. This might be reasonable if the rebuilding of levees would permit the borrowing of additional money on the land, but no one contends that it will.

Taking into consideration the fact that many of the landowners are poor and have large families to clothe and feed, that the land is taxed to the limit for drainage and general taxes in addition to the levees taxes, and is heavily mortgaged, and that there are no money crops being raised, it is easy to see that the local interests cannot be depended upon to provide any money.

If anyone really believes that reclamation is involved in this problem, then it is his duty to sponsor a plan to provide the funds for the levee districts, which they are unable to provide themselves; and consequently as part of a reclamation plan there should be a provision that the United States government create a new levee district buy the capital stock and bonds in order to finance it and give long-time payments, justified by the prospects of returns from the benefits added by the flood protection works.

Of course any careful analysis of the problem will result in the conclusion that it is a national duty and should be paid for entirely out of the funds of the national government.

The Mississippi River Commission itself, the agency which has been at work upon the project of flood control in the lower valley for more than forty years, abandons all contention that this is a problem of reclamation and does not claim that there would be any immediate land benefits as an argument for local contributions. Its only reason for insistence upon the

continuance of this unjustifiable practice is that it is necessary in order that the commission would not be forced to meet demands for flood control works where they were not needed or justified. This is merely an attempt to evade a responsibility, and which would only be deserving of consideration if this were a problem of reclamation, but should not be noticed where the protection of life and property is the sole consideration.

The people of the United States are willing to supply all the money necessary to prevent a recurrence of a flood like that of the Mississippi river of 1927, but are not willing to spend large sums of money for reclamation and navigation at this time.

As my bill relates only to flood-control measures for the protection of life and property and interstate commerce the funds must be provided by the government.

Bills combining flood control, reclamation and navigation confuse the issue and the public is led to believe that large sums of money spoken of in these bills are for flood control, when in truth millions of dollars are carried for other items. The amount of money necessary at this time for flood control alone is small when compared with the sums required for reclamation and navigation.

FINANCIAL CONDITION OF LEVEE BOARDS

1. Scott County Levee District no. 2 (Mo.). Cannot issue more bonds; funds exhausted.
2. Levee District no. 3 of Mississippi County, (Mo.). Sinking fund wiped out by bank failures due to flood; construction funds sufficient only to bring levees up to present standard grade; thereafter can go no further.
3. St. John's Levee and Drainage District (Mo.). Defaulted this year in payment of outstanding bonds.
4. St. Francis Levee District of Missouri. Can issue no more bonds; funds about exhausted.
5. Fulton County Levee District (Ky.). Financial condition bad; can go no further.
6. Reelfoot Levee District (Tenn.). Financial condition bad; can go no further.
7. St. Francis Levee District of Arkansas. Solvent.

8. Helena Improvement District (Ark.). Cannot issue more bonds; taxes up to limit.

10. Laconia Levee District no. 1 (Ark.). Cannot issue more bonds. On verge of bankruptcy.

11. Laconia Levee and Drainage District (Ark.). Cannot issue more bonds; last issue offered received no bids; on verge of bankruptcy.

12. Yazoo-Mississippi Delta Levee District (Miss.). Solvent.

13. Board of Mississippi Levee Commissioners (Miss.). Solvent, but tax outlook very bad on account of practically no crops in 1927 and heavy loss of labor due to flood.

14. Plum Bayou Levee District (Arkansas river). Financial condition hopeless.

15. Farelly Lake Levee District (Arkansas river). Defaulted this year in payment of outstanding bonds. On verge of bankruptcy.

16. Southwest Arkansas Levee District (Ark.). Financial condition very bad on account of bank failures due to flood; would have defaulted this year in payment of outstanding bonds except for fact that Louisiana interests dependent upon this district for protection came to board's assistance.

17. Tensas Basin Levee District (La.). Solvent, but has anticipated revenue for 1928.

18. Fifth Louisiana Levee District. Can issue no more bonds or certificates of indebtedness; district probably has exceeded legal tax limit; financial condition desperate.

19. Saline Levee and Drainage District (La.) No means whatever.

20. Red river and Bayou des Glaises Levee and Drainage District (La.). Funds exhausted; state obliged to close gaps in levee line.

21. Red river, Atchafalaya and Bayou Boeuf Levee District (La.). Solvent, but board has anticipated future revenue.

22. Atchafalaya Basin Levee District (La.). Financial condition hopeless; board has anticipated revenue through 1934.

23. Pontchartrain Levee District (La.). Revenue insufficient to keep levee lines in safe repair; financial condition very bad.

24. Orleans Levee District (La.). Solvent.

25. Plaquemine Parish East Bank Levee District (La.). No funds whatever.

26. Lake Borgne Basin Levee District (La.). Cannot make further contributions; entire district overflowed by artificial crevasse at Caernarvon.

27. Lafourche Basin Levee District (La.). Solvent.

28. Buras Levee District (La.). Has reached financial limit.

CONTROL SHOULD BE VESTED IN THE
FEDERAL GOVERNMENT^{*}

The flood of 1927 was the greatest recorded in the history of the Mississippi river. This flood was preceded by months of unusual rain, but it is doubtful whether such rainfall a decade ago would have caused such high levels in the Mississippi river. Primarily these flood levels are the immediate consequence of raising the height of the levees on the banks of that stream.

But the amount of flood water coming down that great river has actually increased in volume in the last ten years, for during that time those states which are drained by the Mississippi river have been extensively engaged in establishing and completing various drainage projects. As this drainage work progressed, swamps, sloughs and other depressions which for centuries had been natural reservoirs were drained and the water which formerly accumulated in those reservoirs was, by drainage ditches and canals, rapidly carried to the rivers of the Mississippi valley. . .

After years of toil and sacrifice the people of the Mississippi valley believed that the problem of flood control of the great river at last had been solved. With gratitude toward the federal government for all it had done and with pride in the realization that by their own achievements, which had resulted in an expenditure of over \$290,000,000, they themselves had helped to bring about this happy consummation, they felt that their anxiety was over and that they could now reap the reward which years of labor and toil and sacrifice had placed within their grasp.

But the flood of 1927 came. It did what no other flood did. It interrupted over three thousand miles of railroad transportation, flooded over twelve million acres

^{*} By James W. Collier. *Congressional Record*. 69: 1791-4. (current file). January 19, 1928.

of land in one hundred and seventy-four counties in seven states, and carried on the tawny bosom of its rushing waters far more than the homes and the worldly possessions of the people of the Mississippi valley. As flood levels never before even dreamed of were reached, there vanished the hope and the confidence which for generations had sustained them.

It was not the material loss caused by that great flood which accomplished that which no other flood could ever do. It was not the sufferings and hardships of those who were forced to climb to the roofs of their submerged homes and indefinitely wait for rescue. It was not the financial loss of those who saw their cattle and livestock drowned before their eyes and the accumulated savings of a lifetime swept away. The flood of 1927 did far more than this. It destroyed the hopes of over half a century, and, breaking down their morale and fortitude, took the very heart out of the people of the Mississippi valley.

Gazing upon that vast inland sea whose raging waters had rendered over seven hundred thousand people homeless, and knowing that they were unable to further help themselves, they realized that after years of endeavor and exertion, after hundreds of millions of expense, of taxation up to constitutional limitation for flood protection, all their strivings of the past had been vain and useless.

Realizing this, there came the awful fear that they would be forced to abandon the homes they had wrested from the wilderness, homes in which their children were born and around whose firesides clustered the recollections of years of sacrifice and toil.

They feared that they would have to abandon those homes and turn back to the trackless jungle that great section of our country, more fertile than the far-famed valley of the Nile, unless the strong arm of the federal government could be extended; for after the flood levels

of 1927 had been reached they realized that the federal government alone was the only earthly power that could control the rushing waters from the Alleghenies to the Rockies, which, draining over thirty states, poured into the cornucopia of the lower Mississippi valley.

President Coolidge tells us in his message to Congress that the owners of lands behind the levees should pay a proportionate part of the expense of building these levees. He further said:

that an extraordinary concession from the plan adopted in relation to irrigation, where the general rule has been that the lands benefited should bear the entire expense, has already been made to the owners of lands behind these levees.

He also said:

It is the land of this region that is to be benefited. To say that it is unable to bear any expense of reclamation is the same thing as saying that it is not worth reclaiming.

I am sure that the President of the United States is sincerely anxious to do all he can to prevent another great national disaster like that of 1927. He expressed his sympathy to us in many ways. In less than twenty-four hours after the levee broke we had assurances from him that he would do all in his power. He sent one of his great secretaries down to help us, Mr. Hoover, who did splendid work, but I regret that the President believes the building of levees to keep within its bounds a mighty river, whose drainage area is equal to over 40 per cent of the entire United States, a river whose watershed embraces twenty-one of these states and two provinces in Canada, a river upon whose ample bosom in 1926 there floated over seventeen million tons of commerce, valued at over \$700,000,000. I regret that he believes that the building of levees to hold back the waters of such a river is a reclamation project.

With all deference to the opinion of the President of the United States, there is, to my mind, a great difference and distinction between reclamation and levees. Reclamation creates, while levees retain and protect.

Reclamation begins after levees are built. Reclamation adds value to that which is valueless. Levees protect that which has value. Reclamation gives something to the man that he never had. Levees keep the river from taking away from the man something he already had.

Reclamation takes a sandy desert and converts it into fields of wondrous beauty and marvelous fertility. Levees protect farms, cities, railroad tracks, stations, terminals, factories, telephone, telegraph and electric power lines from being destroyed.

Does a road built up through a swamp reclaim that swamp? Do the levees take one gallon of water off of the lands behind them? Do they reduce by one dollar the cost of preparing these lands for cultivation?

When the sturdy pioneers drove the aboriginal Indians from the plains of the west, did they by so doing reclaim those lands, or did they make it possible for settlers to come in and make those great plains one of the garden spots of the world?

Building a levee on the bank of a stream does not clear the land behind it of standing timber nor drain from it its surface waters nor prepare it for cultivation.

Levees do not reclaim lands. All that they do is to make possible the development of the lands behind them. Levees made it possible for over six thousand miles of railroad tracks and over fifty thousand miles of electric power, telephone and telegraph lines to be built.

They made it possible for the development of farm lands which, in 1926, produced over \$250,000,000 of farm products. They made it possible for populous cities and thriving towns and busy factories to be found all over the Mississippi valley.

Levees made all this possible, and they justified the issuance of bonds for concrete highways, drainage districts, and other land improvements, but they did not re-

claim one acre of that vast territory drained by the Mississippi river.

President Coolidge tells us that it is the land of this region that is to be benefited, and that the land so benefited must pay for part of this reclamation.

The presidency of the United States is the greatest political office in the world. Though many channels of information and many avenues of investigation, denied to any other citizen of the United States, are open to the holder of that high position, yet, owing to the manifold and complex interests continually arising in the greatest country in all the world, it is impossible for one man, no matter how well informed he may be, to have an actual personal knowledge of every subject.

It is therefore a source of much regret that the varied and many duties of the Chief Executive of the nation were such that the President was unable to spare the time and visit the scene of the great disaster of 1927.

Had he been able to do this, I am sure that the first-hand information he would have secured would have convinced him that the owners of lands behind those levees had reached the end of their resources and were utterly unable to meet the demand he has imposed upon them.

The land behind the levees is only a small part of the property that is to be benefited. Cities, towns, factories, railroad tracks, terminals, stations, telegraph, telephone and electric-power lines are also benefited, for it is impossible to protect the lands without protecting them, and it is impossible to protect them without protecting the lands upon which they are situated.

Hundreds of millions of dollars from citizens all over the United States are invested in mortgages on land, in bonds, and in factories and public utilities of the Mississippi valley.

In mortgages on land and in bonds other than levee bonds, there is an outstanding indebtedness of over

\$770,000,000. The assessed valuation of the property so mortgaged and bonded is less than \$815,000,000.

There is \$770,000,000 invested in mortgages on land and in bonds and \$45,000,000 is still outstanding of levee bonds. Now, the assessed valuation of the lands so bonded and so mortgaged aggregates \$815,000,000.

In addition to this, millions of dollars are invested in the securities of the various railroads, telephone, telegraph and electric-power companies by citizens who live in every part of the United States, for local ownership of these securities is negligible.

The man from New York, the man from California and the men from forty other states in this union are just as much interested in seeing their property in the Mississippi valley protected from ruin and overflow as the man from Mississippi or Louisiana or Arkansas who owns the land immediately behind these levees.

The *Manufacturers Record* asks this pertinent question:

Is it then just or reasonable to require the farmers who live on the land in the seven affected states to pay a special assessment on their particular form of property, while exempting the owners of the other forms of property who live in the other forty-one states?

Are the people along that territory in a position at this time to finance the building of the necessary protection?

They are not. They have reached the end of their resources. If the plan suggested by the President is a fair one, that the local interests should contribute a part of the cost, even though what is done is for the purpose of maintaining navigation in the greatest artery of trade and commerce in the world—and in 1926, which are the last figures I have, there passed down the river over seventeen million tons of commerce, valued at over \$700,000,000—if that view should be taken of it, the people living behind these levees have already expended

\$290,000,000, and the federal government has expended for that same purpose less than \$70,000,000. I ask you, gentlemen, after they have already contributed \$290,000,000 or over four times as much as the federal government has contributed, in the name of high heaven how much more do you want those people to contribute whose homes have been washed away, whose cattle and live-stock have been destroyed, who are now prone and helpless and have reached the end of their resources. How much more do you want those people to contribute?

In the early days of the republic the entire country was in the scope of a President's vision. George Washington sent three messages to Congress, all relating to the commerce and navigability of the Mississippi river. He did not let the matter rest with these messages, for later he sent Thomas Pinckney to the Spanish Court for the sole and express purpose of entering into negotiations with Spain for the enjoyment of these rights.

"Dipping into the future as far as human eye could see," Thomas Jefferson made the Louisiana Purchase, and by the mere stroke of a pen added more millions of leagues of permanent territory to his country than any conqueror had ever done by the sword. One of the compelling factors which actuated the purchase of that great domain was the important part the Mississippi river would play in the commerce and national defense of the country.

The infant republic was destined to become one of the great powers of the world. With the vast development of our almost unlimited resources, it was impossible for any President to have a personal understanding of every problem, no matter how important it may have been. The opinions, therefore, of those who had personal knowledge are of special value.

Clay, Lincoln and Garfield lived in the Ohio valley and had first-hand information. Henry Clay in an im-

passioned burst of oratory in the United States Senate once said:

The Mississippi river with all its tributaries constitutes a great system, and if the system be not national, I should like to know one that is national.

Abraham Lincoln tells us that:

The most general object I can think of would be the improvement of the Mississippi river and its tributaries.

He then gave one of those illustrations for which he was famed, when he stated there was no difference in principle between driving a pirate from the tracks of commerce on the ocean and the removal of a snag on the Mississippi.

For each is done to save life and property, and to use the waterways for the purpose of developing commerce.

President Garfield said that:

The statesmanship of America must grapple with the problem of this mighty stream; it is too vast for any state to handle; too much for any authority other than that of the nation itself to manage.

President Roosevelt knew the Mississippi river and the Mississippi valley. He had frequently visited the cities and towns in that valley, and he had on more than one occasion hunted bears in the swamps of that river.

His constant thirst for knowledge useful to him in his high place, together with his familiarity with that section, entitled him to speak with authority. He said after one of his visits to the Mississippi valley, "We"—the nation—"must build the levees and build them stronger and more scientifically than ever before."

I repeat that those living behind the levees on the Mississippi river have already expended for flood protection over \$290,000,000, or more than four times as much as the federal government has for this purpose. Yet it is manifest that if the owners of those lands had never spent one dollar toward levee building it would

still be the duty of the federal government, in the interest of navigation and commerce as well as in the interest of justice and humanity, to take charge of a situation which by reason of the magnitude of the undertaking and the complexity of its interests is far beyond the control of any local authority.

Each of the great political parties has repeatedly affirmed this principle.

Speaking through their various platforms the Republican party declared:

The Mississippi river is the nation's drainage ditch. Its flood waters, gathered from thirty-one states and the Dominion of Canada, constitute an overpowering force which breaks the levees and pours its torrents over many million acres of the richest land in the union, stopping mails, impeding commerce and causing great loss of life and property. These floods are national in scope and the disasters they produce seriously affect the general welfare.

The Democratic party declared:

We hold that the control of the Mississippi river is a national problem. The preservation of the depth of its water for the purpose of navigation, the building of levees to maintain the integrity of its channel, and the prevention of overflow of land and its consequent devastation, resulting in the interruption of interstate commerce, the disorganization of the mail service, and the enormous loss of life and property imposes an obligation which alone can be discharged by the federal government.

Surely no one will deny that upon the federal government alone rests the responsibility of maintaining navigation upon the Mississippi river. If levees are essential to proper navigation, then it is the duty of the federal government, whether the land behind those levees is suitable for agricultural purposes or not, to build those levees.

If the building of levees is essential to good navigation, why should they be singled out for local contributions? Engineers have repeatedly declared that building

levees, revetting banks, dredging channels and removing snags are all essential to good and proper navigation.

Has anyone ever advocated the payment of local contributions from riparian landowners for revetment work? Revetment is not only essential to navigation, but incidentally the landowners are benefited, for revetment prevents the banks from caving and the land from being washed away.

Who has ever insisted that the landowners shall be assessed to pay part of the cost of dredging the channel of the Mississippi river? Yet the landowner receives an incidental benefit, for the deeper the channel the more water the river will hold, and to that extent will be less likely to overflow adjacent lands.

Removing snags from the channel prevents accident and permits boats to navigate the Mississippi river without the fear of destruction. If these snags were permitted to remain, a boat would be afraid to venture from the shore. The landowners would therefore in many instances have no way of getting their products to market and consequently land values would decline. Therefore removing snags from the bed of the river incidentally benefits riparian landowners, but where is the man who will insist that the landowners pay to the federal government a proportionate part of the cost of the removal of snags?

When the federal government dredges a harbor and makes it possible for that harbor to be open to the commerce of the world, railroads will immediately establish terminals which will inevitably result in an incidental benefit to lands situated on the water front which will be enhanced in value.

Is there a member of this Congress who will say that because lands in the vicinity of that harbor will be enhanced in value that the federal government discontinue keeping that channel open to the commerce of the world

until the owners of those lands which have been incidentally benefited shall pay part of the cost of dredging and keeping open that harbor?

If a mob were to assemble in one of our largest states and invade a weaker state in such force that the invaded state was unable to drive it back, would that be only a local matter, or would it not be the duty of the federal government to intervene and protect one of its states from the unlawful aggressions of the citizens of another state?

When a great devastating enemy, the cruel waters from nearly half of this union invade a section of our country, destroying not only lands and property but the lives of American citizens, is that a matter of local concern? Shall this great government of ours, the richest and most prosperous in the world, and which at the same time is the hope and the envy of all Christendom, protect its own citizens? During the greatest war of all the ages our government not only financed itself but its allies. When Europe was threatened with financial disaster, it extended across the water a helping hand, and re-established European credit, balanced European budgets, and stayed the further depreciation of European currency.

Shall the strong arm of that government be extended to ward off those cruel waters, or shall that great government stand idly by until the families of those who have lost their lives together with others whose accumulated savings of a lifetime have been swept away, shall again dig into their now empty pockets and pay to that government a sum of money which conflicting authorities might determine would be their cost of repelling the attack of the rushing waters from nearly half of the United States and from part of the Dominion of Canada?

Has any city, town or state in America jurisdiction over any part of the Mississippi river? No boat can sail upon its bosom, nor can a pilot direct its course

without each first securing the consent of the federal government. Not one single place from Lake Itaska to the gulf can this mighty river be bridged without the approval of the federal government.

When the city of New Orleans wished to cut the Poydras Levee on the other side of the river to prevent a catastrophe which might have resulted in loss of life and destruction of property fearful to contemplate, the great state of Louisiana and the metropolitan city of New Orleans were both helpless in the face of that awful danger and could make no move until sanctioned by federal authority.

If it be the policy of the federal government, the wisdom of which I have yet to hear denied, to exercise control over every part of the Mississippi river, does not this exclusive right to absolute control carry with it a corresponding duty to keep that river within its bounds?

From the remotest antiquity rivers have played an important part in military activities. The Mississippi river is a part of our system of national defense. In the event of war, or in a great national emergency when it might be necessary to expeditiously transport men and supplies to and from the west to the east, for a situation to recur like that of 1927, when from Cairo to below the plains of Chalmette practically all railway and highway traffic was indefinitely interrupted might result in injury incalculable and irreparable.

Divided effort and divided responsibility can no longer control the Mississippi river.

Even if the citizens of the lower Mississippi valley were able to pay a proportionate part of the expenses of flood control, would it be wise policy on the part of the federal government to force them to do this? Contributions from local communities would make them partners of the government and would entitle the contributors to a voice in the way these moneys jointly contributed might be spent.

We would again be confronted with a score or more of different levee districts each striving to outbuild the other. Rich communities will build stronger than their weaker neighbors. Some communities may not be able to contribute at all, or else may fall behind with their contributions. What, then, will be the attitude of the federal government? A chain is no stronger than its weakest link. Would the federal government stop work on that levee until those living behind it made their contributions? If that were done, a gap might be left through which the water might rush five hundred miles, and overflow those whose levees had been built to standard grade.

One of the greatest problems of the levee system is the proper location of levees. This problem has not only been one of the utmost concern to those whose lands are taken for that purpose, but it has also been the subject of great divergence of engineering opinion. No local authority will ever locate a levee behind a town to be destroyed by the flood. Yet the importance of the proper location of a levee may make this imperative.

President Garfield was right when he said that the control of the Mississippi river is too vast for any state to handle, and too much for any authority other than that of the nation itself to manage. If this control is too vast for any state to handle, how much more vast will be the difficulty if this control, even in part, were delegated to a score of different levee districts, some rich, some poor, each looking out for its own interests and each dominated more or less by local politics.

Whether the federal government insists or does not insist upon the local interests contributing 20 per cent of the cost of building levees on the Mississippi river, it is certain that these overflowed communities are now impoverished and are utterly unable to meet these demands. They have reached the end of their resources.

Of the \$290,000,000 expended by local interests there is still outstanding a bonded indebtedness of \$45,000,000. In addition to this these overflowed lands are heavily bonded for drainage systems, concrete highways, school-houses and other purposes.

Commerce decrees, humanity urges, duty impels, common sense dictates, and justice demands that absolute, complete and entire control of the floods of the Mississippi river and its tributaries be vested solely and alone in the government of the United States.

As one who was present in the affected territory during the entire period of the flood, I wish in behalf of the people whom I in part represent to express our sincere appreciation of the work accomplished by that great humane organization, the Red Cross, and the kind sympathy of the people from all over the United States which was so freely and so substantially extended during that great disaster.

The Red Cross needs no encomium from me or from anyone else. Its noble work speaks for itself. Its kindly ministrations and its charitable deeds are engraved upon the hearts of millions of its beneficiaries. To the people of the Mississippi valley in the darkest hour of their history, the Red Cross indeed and in truth was the great mother. God alone knows what would have happened to those hundreds of thousands of poor unfortunates, who utterly destitute were driven from their homes had it not been for the work of the Red Cross and the generous contributions of food and clothing which from all over the United States came into the flood-stricken area.

As long as the memories of the greatest flood disaster in our nation's history survive, just so long will the people of the Mississippi valley hold in grateful and affectionate remembrance the magnificent work of the Red Cross and the unselfish, bountiful generosity of the American people.

Mr. Chairman, the people of the Mississippi valley do not come before this Congress as suppliants. By their toil and sacrifice they built levees long before the federal government contributed one dollar for that purpose. Never recognizing the right to force them to pay for the incidental protection they might receive from the building of a levee essential to the proper navigation of the greatest artery of trade and commerce in the world, yet they cheerfully and willingly contributed of their means until their resources were exhausted.

I challenge the pages of American history to show where a braver battle was ever waged than the fight made by the citizens of the Mississippi valley. Interrupted by frequent and repeated inundations, they carried on. Raising their levees higher and higher, building cities and towns, erecting school houses and churches, completing roads and highways, establishing factories, and preparing for cultivation millions of acres of land, they made their part of the country one of the greatest wealth-producing, taxpaying sections of America.

By persistent effort, by tireless perseverance, and by working and striving, and by striving and working, they met and conquered the mighty forces of nature, and it was only when these tremendous forces were aided and supplemented by the hand of man did they at last give up the unequal struggle.

They ask for no subsidies. They make no demand for reparations. They do not ask the federal government to restore to them one penny of the \$400,000,000 of property destroyed forever by that flood. They do not ask the federal government to pay one dollar on the \$45,000,000 of levee bonds outstanding. They do not ask the federal government for aid to rebuild their demolished homes, nor to restock their depleted farms.

They know that divided effort and divided responsibility can no longer control the flood waters of the

mighty Mississippi, but that this great task can be accomplished only by unified effort and unified responsibility. Such effort and such responsibility can be vested only in the federal government.

If this is done, if the federal government takes charge, if that restless river is controlled, a brave and resolute people, by industry and toil, will rebuild their wrecked and ruined homes, pay off the mortgages on their devastated lands, redeem the bonds for which those lands are pledged, and convert a valley of desolation and ruin into a garden of happiness, prosperity and contentment.

BRIEF EXCERPTS

Flood control is clearly a national problem.— *President Coolidge. Message to Congress. December 6, 1927. p. 14.*

The trial marriage of federal and local interests in flood control has failed.—*Joe H. Moore. House Hearings. 1927. p. 1021.*

It is generally believed that it is the privilege as well as the duty of the federal government to intervene when states fail to protect the life and property of their citizens.—*Walter Y. Kemper. House Hearings. 1927. p. 1325.*

It is folly, worse than folly, to ask the landowners along the Mississippi and along the tributary streams to make further contributions to the cost of flood works. . . They have paid until they are absolutely broke.—*James A. Finch. House Hearings. 1928. p. 1005.*

In all the world there are no lands more fertile than these more than 19,000,000 acres, always face to

face with the menace of flood. It is a land where everything from cotton and corn to wheat and sugar grows.—*L. C. Speers. Nation's Business. 15:42. November, 1927.*

The floods of 1927 demonstrated to everyone, beyond the shadow of a doubt, that the half measures and the half policy of the federal government are not adequate and cannot be relied on for safety by the people living in the lowlands.—*Walter Parker. Pocket Bulletin. 27:14. July, 1927.*

There would then be no nation-wide argument among engineers as to whether levees only, or levees plus spillways, or levees, spillways and source stream control are required, once the government clearly declares its objectives.—*Walter Parker. National Real Estate Journal. 29:49. January 23, 1928.*

The army engineers have recommended that Louisiana pay 20 per cent of the cost in cash, plus all rights of way, plus all lands to be flooded and plus all damages awarded by the courts. The total cost to be assessed against Louisiana under this plan has been estimated at between \$44,000,000 and \$60,000,000. The uplands would not be inclined to pay this bill. The lowlands which have just been devastated could not pay it.—*Walter Parker. National Real Estate Journal. 28:49. January 23, 1928.*

From the day when Thomas Jefferson consummated by treaty the Louisiana purchase, the flood control of the Mississippi river and its principal tributaries has been a problem of the first magnitude. That treaty transferred the jurisdiction of the entire Mississippi river to the federal government, and for that reason, if for no other, the elimination of the menace of such a flood as has

this year overwhelmed the lower valley of the Mississippi is today, as it was in the days of Jefferson, a national and not a state or local problem.—*L. C. Speers. Nation's Business. 15:42. November, 1927.*

It is my deliberate conviction that the problem of flood control is a national problem, because the flood areas are too large, the flood damages too great and the flood sources are too remote for effective local or even state administration. In the second place, flood control by the federal government is not only justified by reason of the extent of the territory affected but in my opinion this problem is a proper subject for governmental attention because of the established economic fact that any preventable calamity which injuriously affects the welfare and prosperity of the people of any considerable portion of the country cannot fail to have a detrimental effect upon the rest of the country. That which harms a part of the people is a matter of profound concern to all the people, especially if the conditions are incapable of control by the local community.—*Len Small. House Hearings. 1927. p. 7-8.*

The officers and members of the American Federation of Labor believe that the cost of flood control in the Mississippi valley should be borne by the federal government. The task is so great and the problem so complicated and difficult that it seems that the federal government is the proper agency to undertake and complete this great enterprise. Besides, all the people will be benefited either directly or indirectly, by the conservation of property, health and life in the vast section of our country included within the flood district. The character of the work, its permanency, and the fact that the situation requires that the flood control work must be performed in a number of states lend force and effect to

the argument that the work should be undertaken and completed by the federal government.—*William Green. Letter to Senator Hawes. Congressional Record. (current file). February 20, 1928. p. 3296.*

These floods are not caused alone by the act of God, by the deposit of snow and rain, but in recent years have been contributed to by the act of man, and this contribution by man is constantly increasing. The millions spent annually on good roads are constantly forming drainage systems which carry water with an increased velocity to the basin. Drainage systems add to this velocity. Forests have been denuded which held back in restraint the quick flow of rain water. Swamp lands have been converted into farms, and the natural provisions of nature for holding back the waters have been destroyed. I am not discussing the lower valley now, which is in immediate distress. This artificial precipitation comes from above that district, beyond its reach and control. In addition to this, Chicago has cut a canal from Lake Michigan to the Illinois river, and it is difficult to determine how much of the waters of the Great lakes are flowing past New Orleans.—*Harry B. Hawes. Congressional Record. (current file). March 9, 1928.*

The government must give relief to the entire Mississippi valley which includes all of the states with tributaries flowing into the Mississippi river. It is a national problem and the expense must be borne by the United States government, because the states are not able to raise the necessary funds, and complications would hazard the completion of a constructive flood-control program. A combination of flood control by the government and the states, in my judgment, would be a detriment to the progress of flood control. The states, where the heavy floods occur, are not financially or physically

able to combat with such floods as the flood of 1927, and consequently the government of the United States should have full charge of the building of levees, spillways, flood ways and reservoirs. If the states were to have a part, either financially or in designing the plans for flood control, there would be conflicts and the results would be very detrimental, in my judgment, to the success to be attained.—*William E. Hull. Speech in Congress. January 31, 1928.*

That the United States must undertake this gigantic work and pay for it is a foregone conclusion. The difficulties in the way of apportioning part of the cost to the lower Mississippi states are insuperable. No method can be found for justly apportioning their share of the cost. No state has the right to expend money for enterprises outside of its boundaries. But beyond these difficulties is the outstanding fact that the lower Mississippi states are not responsible for the floods and should not be taxed to control them. The Mississippi river is a national stream draining many states and benefiting or damaging American people, as the case may be, without regard to state lines. The lower states have already taxed themselves for scores of millions for local protection only to be overwhelmed last year as if they had not spent a dollar. They cannot control the river. If the nation is in duty bound to pay for any part of flood control work, it is bound to pay for all of it. The river is not the property of any state or group of states. It is the property of the United States, and the owner is responsible for the damage done by his property.—*Editorial. Washington Post. February 17, 1928.*

It is doubtful whether the country at large appreciates the importance of the rehabilitation feature of the Mississippi valley disaster. Take the delta counties of Mississippi for example. Does one man in a thousand

appreciate the fact that the flooding of those counties directly affected every textile mill in the United States that uses the long fibers? How many people are aware of the vast loss to the cane sugar industry by the submersion of great areas of Louisiana's famous "Sugar Bowl" parishes? Or of the loss resulting from the drowning of thousands of acres of ricelands? Or from the destruction of countless fields of corn? Totalled, they represent a money loss of probably more than \$200,000,000—some have put it as high as \$500,000,000. Add to this the loss from the destruction of houses and other buildings; the millions that disappeared when railway tracks and bridges disappeared beneath the water; the millions in prospective crops which vanished when the second flood wiped out the last vestige of hope. Truly, it is a situation which directly or indirectly affects every business, every breadwinner, every consumer in the nation.—*L. C. Speers. Nation's Business. 15:44. November, 1927.*

Each Member [of Congress] who has observed the people of his state or district suffering unmeasurably by reason of these floods expects, and has a right to expect, that if flood control is made a national matter in one part of the United States, that it should and must be made a governmental responsibility in any part of the United States where people suffer from a like cause. The contention of the people living on the tributaries of the Mississippi river that they are entitled to national relief is just as plausible as that of those living on the Mississippi itself. In our opinion, floods cannot be controlled on the Mississippi until they are controlled on these tributaries. Any plan of flood control on the Mississippi without taking into consideration the necessities and rights of the people on these tributaries would be patchwork at the best. In fact, it would be but following the policy of the government for the last fifty years

on the Mississippi, which the floods of 1927 demonstrated to be a colossal failure. Would it not also involve duplicate work? That is, are there not things that can be done on the tributaries, if all the tributaries as well as the Mississippi are to be taken into one general plan, that would make it unnecessary to do some things suggested to be done with a plan of action at this time upon the Mississippi alone. Why not make of this question a comprehensive one? There is no denying but what in the interests of the United States as a whole that these tributaries must be taken care of. The Mississippi river floods are never caused by Mississippi water alone, but the destruction of lives and property commences only after these tributaries have discharged their great volumes of water into the main stem. Why try to control this alone by work on the Mississippi when it has already been proven that it cannot be done? I venture the assertion that if the recommendations of the President and the army engineers are carried out at this time and the work limited only to the Mississippi, as they suggest, that in the end, after we have done what must be done, controlled the tributaries as well as the Mississippi, that we will find that we have wasted millions upon this project.—*E. B. Howard. Speech in Congress. January 9, 1928.*

The early settlers along the banks of the lower Mississippi saw the necessity for controlling the floods. They built makeshift levees along the river banks, and as the pioneer population swept into the valley dikes and levees were constructed by these pioneers. The first efforts were individual efforts and then, through a community spirit, by organized districts. One by one the states, as they grew up and became a part of the United States, undertook some form of legislation with respect to these floods; but it was a hopeless task for any state or group of states. From 1714 until the

creation of the Mississippi River Commission in 1879, the entire expense of the fight against the floods was borne by the states and local subdivisions. Immediately upon federal participation came absolute federal control. Today a private citizen cannot build a boat, a dike, a bridge, a dam or revetment without permission from the national government. Its authority is supreme; its control absolute. Yet under this federal control and direction this territory has lost in floods, in 1903, \$40,000,000; in 1912, \$78,000,000; in 1913, \$12,000,000; in 1916, \$5,500,000; in 1922, \$17,000,000; and in 1927 between \$236,000,000 and \$284,000,000. This shows a total loss of over \$400,000,000 in less than twenty-five years. To prevent this great loss the states had spent \$292,000,000, while Congress had contributed only \$71,000,000, leaving a difference of \$221,000,000. The whole theory of local contribution and dual responsibility is illogical, unsound and impossible of equitable application. The only argument in its favor is precedent, and the precedent is unsound because there has been a change in conditions and a recent frightful demonstration which has destroyed the precedent. So precedent must be set aside and the nation take the problem fully in hand and solve it as a national problem at national expense. Local contributions cannot be equitably imposed. The contribution of the states is not uniform. The attempt to make Missouri pay for Illinois, or Kentucky contribute to Tennessee, or Arkansas to Louisiana, cannot be worked out on any equitable basis, and finally leaves the vast burden to be borne by Louisiana, when, as a matter of fact, the cost to Louisiana is of benefit not only to all the adjacent states but to the entire valley.—*Harry B. Hawes. Congressional Record. (current file). March 9, 1928.*

NEGATIVE DISCUSSION

LOCAL FINANCIAL COOPERATION ESSENTIAL ¹

The present statutory requirements relating to local cooperation are stated in paragraph 117 of this report. In brief, the law, contained in the first flood control act, approved March 1, 1917, prohibited the expenditure of any money authorized by that act in the construction or repair of any levee unless and until assurances had been given that local interest protected thereby would contribute at least one-half as much as would be allotted by the commission from federal funds. The law continued the requirement that local interests furnish rights of way for levees free of cost to the United States, the costs of such rights of way and of securing them not to be included as part of the statutory contribution. Likewise money spent by local interests in emergencies or for maintaining a levee line might not, under the act, form a part of a contribution toward levee construction and repair.

The second flood control act, approved March 4, 1923, extended the provisions of the first act for six years, and it is under the second act that operations of the commission, relating to flood control, are now carried on.

The commission, while realizing that future local cooperation in flood-control costs and operations must be a matter for determination by Congress, feels that it should, with its intimate knowledge of levee construction,

¹ *Special Report of the Mississippi River Commission*. November 28, 1927. p. 81-3.

repair and maintenance extending over many years, set before the Secretary of War its views on this important subject. In expressing these views the commission does not attempt to speak on the subject from a national viewpoint, leaving that to the legislative authority, but confines itself to the viewpoint of advantages and disadvantages of a requirement of local contributions on the work entrusted to the commission.

The commission is firmly of the opinion that some degree of local financial cooperation is essential to a successful accomplishment of a flood-control project. This opinion is based not on a belief that local interests should share in the cost by reason of their being beneficiaries but on the belief that without a local sharing in the cost, the commission, as an agent of the federal government disbursing federal funds, will be confronted by inordinate demands for flood-control work not needed nor justified. Levees, or other flood-control works of large cost will, if granted free of cost, be demanded for the protection of areas insignificant in size and value, merely because the owner would need to underwrite no part of the cost. Even with a local contribution of one-third, as is now required, the commission has been importuned to levee areas unworthy of the cost of such protection. The commission has been able in the past to apply federal funds according to its best judgment by its adoption of and adherence to a policy requiring that applicants for federal aid prove the worthiness of their levee projects. This has been possible because the only cases presented would, if approved, entail liability on the applicants for the costs of rights of way and one-third the costs of construction. With no restriction on demands the commission foresees a multitude of projects of little or no merit, which it should deny in the interest of the public whose funds it will handle, but which, lacking authority to call for an outlay of funds by the applicants, it would find difficult or impossible to deny. The com-

mission would view with deep concern the adoption of a federal flood-control project that would absolve local interests from participation in costs in levee maintenance. It believes that part of the cost thereof should be borne by the local beneficiaries. On the other hand, it believes that the federal government should pay part of the maintenance costs and should reserve full control of such work. The federal government alone is equipped with vessels and plant to meet emergencies and should stand ready to perform that function.

The commission suggests that an equitable basis of division of future flood-control costs would be, as in the flood-control act of March 1, 1917, to include both the building of new levees and the raising of old ones to the 1914 Mississippi River Commission standard levee grade and section. That grade and section was in force, and an accepted fact, when the flood-control act referred to became law and has since been recognized by levee districts along the river and on sections of certain tributaries as fixing the bounds of local contributions under the act. Similarly, the standard grade and section of 1914 was the grade and section in force when certain parts of other tributaries of the Mississippi river between Rock Island, Ill., and Head of Passes came within commission geographical jurisdiction by the flood control act of March 4, 1923.

The commission believes that costs of enlargements of levees in excess of the 1914 grade and section and the excess cost of new levees over the same grade and section may properly be assumed by the United States without local contribution.

The commission, however, believes that relocation of the levee line for the purpose of increasing the flood way along the main river may properly be paid for by the United States, except that local levee districts should pay costs of land and rights of way and damages.

The commission believes that rights of way should

be furnished to the United States by local interests free of all cost to the United States, as in the past, for new and enlarged levees and for relocation of levees.

The commission strongly deprecates the assumption by the United States, by purchase or otherwise, of title to the land on which levees are now or will hereafter be built. Such assumption would entail serious delays in levee work and would result in the establishment of numerous federal reservations difficult to administer and police.

The commission believes that the United States should bear some part of the cost of levee maintenance and repair after completion of the levees and that upon completion of a levee forming a definite link in the levee system, as determined by the commission, such levee should not be turned over to the levee district protected thereby for care and maintenance but should be maintained by the United States, the cost to be apportioned two-thirds to the United States and one-third to levee districts protected.

The commission believes that the following provision of the flood control act of March 1, 1917, should be modified accordingly:

Upon the completion of any levee constructed for flood control under authority of this act, said levee shall be turned over to the levee district protected thereby for maintenance thereafter; but for all other purposes the United States shall retain such control over the same as it may have the right to exercise upon such completion.

The commission believes that bank protection on the main river should be paid for wholly by the United States as in the past, whether it is designed principally to protect levees or to form a part of the general improvement of the river; and that bank protection on the tributaries of the Mississippi, within the jurisdiction of the commission, should be paid for two-thirds by the United States and one-third by the levee district concerned, as has been required by commission policy based

upon its interpretation of the flood control act of March 1, 1917, such revetment being primarily for the protection of levees.

Except as recommended above for levees and revetments, the commission believes that the cost and maintenance of flood-control works will have to be paid for by the United States. While local participation in the cost of such works may be equitable, it is deemed to be impracticable as the benefits accrue to certain states at the expense of others.

The commission believes that protection of lands of small value except for timber and basins of small area will be discouraged by a requirement of local participation in cost.

The commission is aware that its operations in the past have been at times hampered through the failure of some levee districts to furnish assurance of their share of the funds needed for levee work, thus adversely affecting the prosecution of the work, but believes that the advantages derived from local participation in costs would more than compensate for such disadvantages.

A REASONABLE BURDEN²

In view of the national aspect of the flood-control problem from the standpoint both of the cause and of the effects of the floods, and in view of the large sums spent in the past by the people of the valley for flood protection, the sacrifices they have made in meeting their allotments, the great losses suffered in the past flood, and the larger expenditures now required, it is believed that the United States should bear a larger proportion of the cost of construction than in the past, and that of the states or local interests be as small as consistent with the results desired. While the proportion must be determined in the wisdom of the President and Congress,

² *Report of Gen. Jadwin. December 1, 1927. p. 11-12.*

a division by which the United States bear 80 per cent and local interests 20 per cent of the cost of levee construction and control works in general; and by which the United States bear 50 per cent and local interests 50 per cent of the cost of the special ring levees proposed at Morgan City, Melville, Simmesport and Arkansas City, would be in general accord with the existing policy of the President and the precedents established by Congress.

The expenditure for flood-control structures proper required in the comprehensive plan herein recommended, exclusive of navigation works, revetments, etc., is \$185,400,000.

On the basis suggested, the total construction costs would be divided as follows:

By the United States:

80 per cent of general levee and control works..	\$147,360,000
50 per cent of special protection works.....	600,000
100 per cent of works for channel stabilization and mapping navigation.....	111,000,000
Total.....	258,960,000

By local interests:

20 per cent of general levee and control works..	36,840,000
50 per cent of the special protection works.....	600,000
Total.....	37,440,000

The local interests are also expected, under the project, to furnish rights of way, and protect the United States against charges for flowage easements and damages.

While \$37,440,000 is small in comparison with the amount to be spent by the United States and with the amounts already spent by the people of the valley, it must be remembered that these people still owe considerable sums on their bonds on which the money spent was raised. Some of the levee districts are also near the limit of their bonding power under present state law and also near the limit of their credit. However, it is not equally clear that this expenditure, spread over a

ten year period among four or more states, would constitute an unreasonable burden on the states themselves, in view of the increased taxable values which will result from the improvement.

BIG SCALE LOG ROLLING*

Months ago the *Plain Dealer* sounded a warning that flood control as a sound legislative program was endangered by log-rolling methods in Congress. The scheme, we said, "consists of organizing separate groups, each desirous of congressional approval of some important and costly enterprise, into a single body pledged to support all of them."

The procedure is unhappily familiar. Statesmen have opposed it for years. Politicians never hesitate to resort to it.

A staff correspondent of the *Chicago Tribune* now makes an investigation of the facts, and at its conclusion declares the flood control measure "was put through Congress by a pork barrel conspiracy and log-rolling manipulation unparalleled in the annals of treasury lootings." He brings proof to sustain what we said in December and adds much more for good measure.

Expenditures estimated to reach \$2,650,000,000 are contemplated by four great measures now in process of early enactment; the four, says the *Tribune* man, have been linked together in a pork barrel partnership which so far has defied even the President of the United States to defeat or radically amend. The four treasury raiders are:

- 1—Mississippi flood control, believed to mean a federal expenditure of \$1,500,000,000;
- 2—Boulder dam, estimated to cost \$450,000,000;
- 3—Farm relief, to cost some \$400,000,000;
- 4—Columbia basin reclamation, \$300,000,000.

* Editorial. *Cleveland Plain Dealer*, May 3, 1928.

Flood control is pending in conference. The bill contains features which Mr. Coolidge says he cannot accept.

The Boulder dam bill is pending in the Senate. Southern Democrats who look on flood control with particular favor are expected to support Boulder dam in return for support of their own bill.

Farm relief has passed the Senate and is reported favorably to the House. Its advocates appear to have a reciprocal agreement with the supporters of flood control. New York Democrats support relief and are accused of having political motives for doing so.

The Columbia basin bill looks like the weak member of the pork barrel sisterhood. Its cost—a mere \$300,000,000—makes it less conspicuous, but the policy of one-for-all-and-all-for-one seems to promise much. By manipulation of support, by propaganda, lobbying and log-rolling the victory appears probable unless public opinion can be aroused to resist it.

Here is a situation that invites rebuke. It smells. The influences brought to bear on members of Congress to persuade them to support measures which their unaided judgment might condemn are destructive of that free action which alone should control matters of such moment. One need not accept in toto the stories of large funds raised to further the purposes of the lobby, of good times shown members at Washington, of home sentiment enlisted to bring pressure to bear on congressmen, of the activities of William Hale Thompson on behalf of a generous policy toward Mississippi control; discard much of it and enough remains to discredit the methods employed to promote this treasury raid.

Flood relief is desirable, of course; but the President's insistence that the federal government shall not foot the entire bill is sound beyond dispute. Others of the log-rolling quartet have merit. Each, however, should be considered on its own and not be put through on the strength of some other bill's strong points.

Log-rolling constitutes offensive meddling with legislation. It would be unfortunate if in this case it operates to defeat a meritorious measure or to pass one that merits defeat.

ARGUMENTS IN THE NEGATIVE⁴

The Committee's recommendation that the federal government assume the entire cost of construction and maintenance of flood-control works for the lower Mississippi contemplates that the federal government at public expense should enter upon a vast reclamation project, and that as to this project the principle that benefited lands should in whole or in part bear the cost should not be used.

The region affected by flood waters from the Mississippi constitutes the bottoms extending on both sides of the river and is the greatest area of alluvial soil in the United States. In the northern portion of these bottoms is the so-called Yazoo delta, where the average yield of cotton per acre, around two hundred and sixty-five pounds, is the highest in the cotton belt and the cotton grown in the Yazoo delta is of superior quality, being long-staple upland cotton. In the lower portion of these bottoms is the one area within the continental United States where the production of cane sugar has been important—in other words, a region where sub-tropical crops are grown. This area is a part of the Atchafalaya basin.

In addition to these two basins there are the St. Francis basin, which is northermost, and the Tensas basin, which lies between the Yazoo and the Atchafalaya basins. These basins are the geographical divisions of the great flood plain in which they lie.

As is usual in alluvial plains which are built up from

⁴ From *Referendum no. 51. Chamber of Commerce of the United States*, October 31, 1927. p. 5-23.

deposits of the river along which they lie, the land naturally tends to be highest along the river, with lower lands toward the outer edges of the alluvial plain. These lower lands usually contain swamps and through them are "back rivers" which are important outlets for flood waters.

This was the natural condition of the lower Mississippi valley. Any present doubt upon the point should be dispelled by reference to the areas granted by Congress to the three states now most concerned with floods in the Mississippi. Arkansas, Mississippi and Louisiana were "public-land" states. In 1850 Congress passed a law (Act of September 28, 1850, 9 Stat. L. 519) granting swamp and overflow lands in the public domain to the states in which they lay, "to enable the several states to construct the necessary levees and drains to reclaim the swamp and overflow lands therein." Under this statute the three states now most in question received the following amounts of land, a very large part of which lay in the alluvial bottoms of the Mississippi:

Louisiana	9,429,000 acres
Arkansas	7,686,000 acres
Mississippi	3,343,000 acres

In other words, the grants of federal lands to these three states constituted thirty-two thousand square miles, whereas the entire area affected or threatened by flood waters from the Mississippi does not exceed thirty thousand square miles.

In the original state of the lower Mississippi high water spread into the low-lying portions of the alluvial plain and passed into the "back rivers." In the lower part of the valley these back rivers frequently carried the water they received all of the way to the gulf, without returning any part to the main river. The Atchafalaya is still such a back river. On the other hand, if the back rivers returned the water eventually to the main river, they and their adjacent low lands had served to

retard it, with the result that they decreased the height of the flood in the main river by pouring back their waters after the crest had passed. Thus, to care for flood waters there was a great flood plain with the characteristics usual in such plains. This plain extended the whole length of the lower Mississippi valley and had a width never less than twenty miles and at points reaching nearly one hundred miles.

In the higher land along the main river and the other streams the soil is usually a fertile loam which drains readily. In the lower swampy lands back of the streams, and between streams, the soil inclines to be a heavy clay which does not drain easily and which is often called "buckshot." Soil conditions, together with the availability of waterways for purposes of transportation, led to the settlement of the lands along the streams. It was wholly natural that efforts to provide permanent protection should be largely concentrated in front of these lands. The consequence is that today the lines of levees along the Mississippi represent an attempt to confine within an area which at places is not two miles wide flood waters which formerly spread over an area at no point less than twenty miles wide.

That the impression which is sometimes given, that the flood waters in the lower Mississippi valley come wholly from other states, is not correct may be gathered from the data of the Weather Bureau, which show the lower Mississippi valley is a region of heavy rainfall. At a number of points the average annual rainfall is sixty inches or more. These figures mean that the lower Mississippi valley receives more rainfall than any other portion of the entire drainage basin of the Mississippi. Moreover, the season of heavy precipitation in the lower Mississippi valley usually comes between December and the end of March—*i.e.*, comes at a time of year which corresponds to the period of the flood of 1927. In the other portions of the drainage basin of the Mississippi

the heaviest precipitation tends to come in the months beginning with May.

Exact figures as reported for cities by the Weather Bureau for normal precipitation and actual precipitation show the same general relation of annual precipitation in different parts of the drainage area, being as follows:

	Normal	Actual 1926
New Orleans	57.42 in.	75.86 in.
Memphis	50.34 in.	41.98 in.
Little Rock	49.89 in.	44.40 in.
Nashville	48.49 in.	54.50 in.
Pittsburgh	36.35 in.	35.44 in.
Indianapolis	41.48 in.	41.75 in.
Peoria	36.29 in.	50.00 in.
Madison	31.71 in.	30.33 in.
St. Paul	28.68 in.	27.34 in.
Des Moines	32.45 in.	32.85 in.
St. Louis	37.20 in.	33.35 in.
Oklahoma City	31.69 in.	37.85 in.
Dodge City	20.84 in.	19.19 in.
Omaha	30.66 in.	25.96 in.
Pierre	16.63 in.	15.44 in.
Bismark	17.64 in.	12.37 in.
Havre	13.67 in.	11.53 in.
Cheyenne	13.60 in.	17.60 in.
Pueblo	11.95 in.	11.00 in.

The heavy precipitation in the lower Mississippi valley means that a large part of its flood problem is local in its origin, this part varying from year to year in accordance with conditions. The precipitation in the lower valley itself causes floods in tributaries to the main river and often creates serious conditions behind the levees along the main river. That this is the case seems to appear clearly from a report submitted by the Interior Department to Congress in February, 1927, respecting swamp and overflowed lands in the Yazoo basin. This report was made at a time, of course, when the levees along the Mississippi were giving complete protection from flood waters from that direction, except insofar as back waters from the Mississippi

came into the lower end of the basin and affected 1,121 square miles. There were found to be in the Yazoo basin sixty or more independent drainage districts which had constructed levees and drains to take care of waters which did not come from the Mississippi but from the basin itself and an area of three times its size in the hilly land immediately behind the basin. Yet, according to the report, further drainage and flood protection were needed for lands already in cultivation and were essential if further lands were to be brought into cultivation.

Since it appears that floods in the lower Mississippi valley do not have their origin wholly in other portions of the drainage area of the river, it becomes appropriate to consider the records of the Weather Bureau with respect to conditions surrounding the flood of 1927. The Weather Bureau is compiling an elaborate report on the subject, which will be published later in the year. Meanwhile, many data are available in the current reports of the Weather Bureau. These data show actual precipitation at cities in the lower valley, and elsewhere in the drainage area, as follows:

PRECIPITATION
Actual (Inches)

	Vicks- burg	New Orleans	Mem- phis	Nash- ville	Indian- apolis	Colum- bus
July, '27	1.39	6.06	1.58	1.59	3.48	3.86
June	4.13	7.78	4.16	4.49	1.24	3.63
May	5.21	3.14	5.40	3.63	5.62	6.48
April	4.74	14.94	13.13	7.38	5.16	3.80
March	8.57	7.99	13.04	9.66	6.32	3.97
February	10.48	10.15	2.89	4.26	2.36	1.62
January	4.30	0.61	3.51	3.27	3.15	3.93
December, '26 ...	9.00	2.18	9.50	13.53	1.95	3.05
November	3.08	2.92	4.23	4.64	1.67	2.22
October	1.57	4.48	3.64	4.64	2.68	4.50
September	1.47	6.01	0.43	2.52	9.33	5.77
August	1.89	7.25	4.40	8.30	4.97	6.13

PRECIPITATION
Actual (Inches)

	Minne- apolis	Kansas City	Bill- ings	Den- ver	Little Rock	Okla- homa City
July, '27	1.86	2.33	1.51	2.36	1.09	3.31
June	6.77	5.75	3.34	2.76	5.71	4.95
May	3.22	5.46	3.70	1.40	6.82	1.94
April	2.48	6.27	2.10	1.53	14.81	4.59
March	2.43	4.60	0.32	2.29	6.89	2.23
February	0.35	0.85	0.19	0.32	3.03	1.07
January	0.54	1.29	0.84	0.18	4.50	1.61
December, '26 ...	1.48	0.96	0.55	1.04	9.46	3.79
November	1.82	1.08	1.40	0.31	3.16	0.83
October	1.61	4.27	0.03	0.69	3.99	3.25
September	5.18	6.33	2.30	1.48	1.19	9.56
August	3.72	3.87	1.02	0.80	3.99	1.23

The Weather Bureau reports monthly upon flood conditions in all portions of the country. Its monthly reports can, therefore, be used as convenient history of the flood of the lower Mississippi in 1927. September, 1926, according to the Weather Bureau, was the first month of 1926 with an outstanding excess of precipitation.

Over large areas in the central valleys the amounts were the greatest ever measured in September and in some localities the greatest in any month. The monthly falls over . . . the southern portions of . . . the Mississippi valley were mainly far above normal. . . Following a rather wet August in the central valleys . . . , the nearly continuous rains of September over the greater part of the same region caused local floods of unusual proportions for that month.

Reporting for October and referring to the floods of September, the Weather Bureau said:

In general the rains which caused these floods began during the second week of August and continued through the early days of October, although they were neither so widespread nor heavy during the second half of September. . . The flood in the Illinois river was the most disastrous and prolonged of the entire group. . . The Mississippi was above flood stage at the beginning of October from Quincy almost to the mouth of the Ohio, with greatest damage to leveed lands around Hannibal.

After referring to floods in November outside of the drainage area of the Mississippi, the Weather Bureau said:

Of the rises in the various tributary streams of the Ohio system which resulted from the heavy general rain of the 15th-16th over that section, the only specific report of damage covered that section of the Little Kanawha drainage area in the vicinity of Glenville, W.Va.

The Weather Bureau's map showing precipitation in December disclosed that the area of greatest precipitation in the country extended over northern Louisiana, eastern Oklahoma, most of Arkansas, much of Kentucky and Tennessee, and northern Mississippi and Alabama, with the wettest part of this area extending from the Mississippi into western Tennessee, where sixteen inches of rain fell. Over the upper Mississippi valley, above Cairo, the precipitation in December did not exceed two inches, and over the great plains from Texas to the Canadian border there was but one-half of an inch. Respecting floods in December the Weather Bureau reported:

The outstanding features of river regime during the month were the general and disastrous floods in the southern streams tributary to the Ohio river, an unprecedented occurrence within the last fifty-four years. . . As a whole, the flood will rank in importance with that of January, 1882. . . Newspaper reports indicate that at least five thousand people in Nashville and four thousand in other places were forced to abandon their homes.

January as a whole was quite dry, only nine states showing average precipitation in excess of the normal. Amounts of precipitation above normal were confined mainly to a narrow area from central Oklahoma and northern Arkansas northeast to and over the Ohio valley.

After reporting the progress of the flood which had begun in the Tennessee toward the end of December, the Weather Bureau continued:

During the December-January period the Ohio river was in flood only from Dam No. 44, Leavenworth, Ind., to its mouth, and only moderately so above the mouth of Green river. The crest passed Cairo, Ill., into the Mississippi river on January 12 with a stage of 48.9 feet, 3.9 feet above flood stage. . . The flood was the earliest winter flood of consequence of which there is record. . . This flood showed some quite remarkable features. In the first place, there was no flood

in the Mississippi river above Cairo nor along the upper and middle stretches of the Ohio, while the Cumberland river broke all previous records, and the Tennessee from Florence, Ala., to near the mouth was the highest since 1897. . . The Mississippi river reached the flood stage of 34 feet at New Madrid, Mo. on January 1, and the flood stage of 45 feet at Vicksburg, Miss. on January 16. . . The Yazoo river was in flood throughout the month. . . The northern tributaries of the Ohio river were generally in flood, although none was serious. . . The flood in the White river system of Arkansas continued at the end of the month.

In the great central valleys the precipitation was very generally less than usual in February. . . Heavy rains over the upper Tennessee river drainage on February 22 and 23 caused a decided rise in all upper tributaries and the upper river. . . The Ohio river passed below the flood stage of 28 feet at Louisville, Ky., on February 1 . . . but not until 10.30 p.m., February 9, at Evansville, Ind. and during the night of February 14 at Cairo, Ill. At Evansville a crest of 44.8 feet was reached on January 30 and at Cairo a crest of 48.9 feet on February 6 and 7. These latter dates marked the end of the flood that began at Pittsburgh, Pa., on January 21. . . The upper Mississippi was also low. This flood did not differ much from other great Ohio river floods, except in the remarkable smallness of the loss and damage. . . The flood in the lower Mississippi river was virtually continuous throughout the month. The river at New Madrid, Mo., reached the flood stage of 34 feet on February 1, a crest of 37.6 feet on February 8, and had fallen only to 29.3 feet on February 26, when another and greater rise set in. Report on this flood must be further delayed, as the river did not reach the flood stage of 17 feet at New Orleans until February 13, and was still rising at the end of the month. The Yazoo river of Mississippi remained high throughout the month, and the Atchafalaya and Ouachita rivers of Louisiana moderately so. . . Heavy rains and melting snows around February 4 and 5 caused another marked flood in the Illinois river with crests from 4.5 to about 8 feet above the flood stages. A full river when the rains began and a low Mississippi river balanced one another and the rise was about normal for the amount of rain and melted snow. . . The lower St. Francis river of Arkansas was also somewhat above flood stage during the greater portion of the month, as was also the Arkansas river near its mouth, mainly on account of the flood in the Mississippi river.

In the central valleys, and notably in the states bordering on the Mississippi river, precipitation was frequent and greatly in excess of the normal for March, particularly in the middle and southern portions, and at the close of the month that river was above flood stages from Cairo southward. Generally speaking, precipitation was in excess of normal, but to a much

less degree, over nearly the entire Mississippi, Missouri and Ohio watersheds.

The Weather Bureau's map shows that in March the area of greatest precipitation in the country covered the whole of the lower Mississippi valley, with three areas of twelve inches in the valley and a fourth in western Kentucky and Tennessee. Respecting floods in March the Weather Bureau said, after indicating it would later report upon the great flood in the Mississippi and many of its tributaries:

The quite heavy rains during the third week of March resulted in floods throughout the Ohio river below Louisville, Ky., and in all its tributaries. . . The Mississippi above Cairo, Ill., except at St. Louis, Mo., was in moderate flood between March 22 and 26, and at the end of the month the advance of another rise had reached Hannibal, Mo. The Illinois river, except the extreme upper portion, continued generally in flood during the month, and there were also moderate floods in the Meramec and Osage rivers of Missouri beginning on March 22 and continuing for a few days. The moderate floods in the White and Black rivers of Arkansas between March 18 and 30 were without special incident, as previous floods had caused all damage that could be done except at very high stages. The Yazoo river of Mississippi remained in flood throughout the month.

The Weather Bureau's map once more showed that in March the area of greatest precipitation in the country was over the lower Mississippi valley, with an area of sixteen inches below Cairo and another in Arkansas. The area of six inches of precipitation extended up the Ohio to the Alleghenies, up the Illinois to the vicinity of Chicago, and across Missouri into southern Iowa. The Weather Bureau said:

The rains in the middle Mississippi valley and nearby areas during the first two decades of April probably exceeded all previous records in that locality for total amounts of fall and length of period during which rain was of almost daily occurrence. In much of this area monthly amounts ranged from ten to fifteen inches, reaching more than twenty inches in some places. . . As a result of these heavy rains the rivers in that section were in flood during the greater part of the month and some had the highest stages ever known. . . The great flood in the lower Mississippi valley continued through the month and

cannot yet be properly discussed. . . Perhaps it will be sufficient at this time to state only that the flood from Cairo, Ill. southward was the greatest in the history of the lower Mississippi valley, although from New Orleans, La., to the Gulf of Mexico not the greatest as to actual stages, as the premeditated cutting of the levee at Caernavon, La., depressed the flood crest at New Orleans at least 2 to 2½ feet, and possibly a little more. . . The Ohio river was in moderate flood from Evansville to Mount Vernon, Ind., on April 16 and 17, and remained at very high stage throughout the month below the mouth of the Wabash river. On account of frequent rains, the interior rivers of the state of Ohio were quite high during the month, although there were only a few minor overflows without resulting damage. The same was true of the Wabash river system, the rivers of which had been very high during the month of March also. The Tennessee river was not in flood during the month except at Johnsonville, Tenn., from April 15 to 18. The floods in the upper Mississippi system as well as those in the Arkansas and Red systems will be treated as a portion of the great flood. It may be remarked that the Illinois river was continuously in great flood throughout the month. Heavy rains on April 7 and 8 and again on April 18 and 19 over the drainage area of the Arkansas river from Wichita, Kans., to the Kansas-Oklahoma line caused more or less severe floods in the tributary streams and a crest at 20.0 feet, 5.0 feet above flood stage, in the Arkansas river at Arkansas City, Kans., on April 9.

The Weather Bureau's map for May showed the area of greatest precipitation—six to eight inches—over the lower Mississippi valley, but with this area extending across the southern half of Indiana and Illinois, and with wide areas of four to six inches to the northeast, the north and the northwest. The Weather Bureau said:

Rains continued frequent and occasionally heavy, as was the case during the two preceeding months, over much of the Mississippi valley region, and the total amounts for the month were above normal in all the states immediately west of the Mississippi river, in all those of the Ohio valley, . . . and from the Dakotas westward. . . Precipitation was of almost daily occurrence in portions of the upper Missouri valley, particularly in Montana, where the monthly totals were mainly the greatest for May and in some instances the greatest received in any month of record.

As to floods during May in other parts of the area drained by the Mississippi the Weather Bureau reported:

The interior rivers of Ohio, Indiana and Kentucky were high during the last decade of the month, with a great flood in the extreme upper Kentucky river, and another but somewhat less severe one in the Wabash river of Indiana. The Kentucky river flood was caused by excessive rains during the night of May 29-30, the amount ranging from 4 to 4.5 inches and probably more in some places. At times the rate of fall was from 1 to 1.5 inches per hour, with the heaviest fall, greatest loss of life, and most destructive flood conditions along the North Fork of the Kentucky river. The number of persons missing or known to have been drowned was eighty-nine, and incomplete reports indicated a loss and damage total of between \$6,000,000 and \$7,000,000. . . Moderate floods during the fourth week of May in the Mississippi river between Quincy, Ill., and Louisiana, Mo. and in the lower Des Moines river of Iowa were well forecast, and actual damage was about \$14,000 only. . . . There was a flood in the Missouri river beginning on May 10 at Pierre, South Dakota, and ending at Kansas City, Mo., on May 18. From the mouth of the Cheyenne river in South Dakota to Sioux City, Iowa, the rise was the greatest of record for the month of May, and the stages reached were the highest since July, 1905.

Data given by the Weather Bureau for the flood in the lower Mississippi in June follow:

In addition to the continuation of the Illinois river flood and the great flood in the Mississippi river and to scattered minor rises in the interior rivers of Ohio, Colorado and California, important floods occurred in the Wabash system of Indiana, the streams of the St. Louis, Mo., district, the lower Arkansas and its tributaries.

The end of the flood in the lower Mississippi was reported by the Weather Bureau in the following statement:

The great flood in the Mississippi river finally terminated on July 14, 1927, with the falling of the water below flood stage at Baton Rouge, La.; and by the end of the month the entire lower river was all within the bankful stage. As noted in the special flood bulletin of the New Orleans Weather Bureau office of August 1, 1927, however, considerable areas of swamp bottoms and between thirty thousand and thirty-five thousand acres of agricultural land were still inundated. As the recession of water from these areas will depend almost wholly upon absorption and evaporation, it will of course take place very slowly.

In area and population the states of Arkansas, Mississippi and Louisiana have the following percentages of the totals for the United States:

	Land area	Population
Arkansas	1.80%	1.66%
Mississippi	1.56	1.69
Louisiana	1.52	1.70

The distribution of the population between white persons and negroes is shown approximately by the Census of 1920, as follows:

	White	Negro
Arkansas	1,279,757	472,220
Mississippi	853,962	935,184
Louisiana	1,096,611	700,257

The wealth of these states and the proportion of the whole for the United States, as computed by the Census Bureau for 1922, are:

ALL TANGIBLE PROPERTY
(1922)

	Total	Percent of U. S.	Amount Per Capita	Percent of U. S. Per Capita
Arkansas	\$2,600,000,000	0.81%	\$1,439	0.49%
Mississippi	2,178,000,000	0.67	1,216	0.42
Louisiana	3,417,000,000	1.16	1,855	0.63

For 1921 the National Bureau of Economic Research computed total income from all sources received by individuals in the different states as follows:

TOTAL INCOME, 1921

	All Persons	Percent for U. S.
Arkansas	\$551,934,000	0.65%
Mississippi	516,984,000	0.61
Louisiana	893,168,000	1.06

The amount of federal income tax paid in 1926 was, for these three states and for other states selected for purposes of illustration:

	Amount	Per Capita
Arkansas	\$4,391,000	\$2.31
Mississippi	3,526,000	1.96
Louisiana	12,582,000	6.55
Alabama	8,276,000	3.45
California	101,712,000	23.56
Connecticut	29,001,000	18.05
Ohio	109,070,000	16.52
Illinois	176,861,000	23.55
Iowa	11,111,000	4.58
Minnesota	28,384,000	10.70
North Dakota	778,000	1.21
Idaho	1,128,000	1.16
Kansas	15,562,000	8.54

Because of the importance of agriculture in the three states with the largest areas within the flood plain of the lower Mississippi, the following data are taken from the agricultural census for 1925. In some respects the figures of this census are not wholly suitable to reflect true conditions in these states but they can be accepted as approximately correct.

FARM VALUES, 1925—Land and Buildings

	Total	Per cent of U. S.
Arkansas	\$540,727,000	1.93%
Mississippi	459,118,000	0.91
Louisiana	324,678,000	0.65

VALUE OF CROPS, 1924

	Total	Per cent of U. S.
Arkansas	\$198,020,000	2.62%
Mississippi	177,006,000	2.37
Louisiana	106,611,000	1.42

It will be recalled, of course, that the lower Mississippi valley was covered with an unbroken forest of hardwoods, and that a large part of this forest still supports a great lumber industry. A map published in 1921 by the Conservation Department of Louisiana shows that in some of the parishes along the Mississippi more

than half of the area is still in virgin forest and that every parish has important areas of cut-over lands. This map showed that of the total of 11,011,000 acres in the alluvial region of Louisiana, 1,815,000 acres were in virgin timber and 2,765,000 acres were cut-over lands.

In two of the three states the value of the products of timber is by far the largest of all manufactured products, and in the third, Louisiana, only the value of petroleum refining is greater. The census of manufactures for 1925 gives the following data:

	Value of All Manufactured Products	Value of Lumber and Timber Products
Arkansas	\$195,000,000	\$73,357,000
Mississippi	200,453,000	95,734,000
Louisiana	710,050,000	121,896,000

The extent of the woodlands, usually in wet areas, explains the apparently low percentage of the land in crops. For 1924 the figures were:

	Land in Farms	Per cent of All Land	Acreage of Crops Harvested	Percentage of Land in Farms
Arkansas	15,632,000	46%	6,226,000	39%
Mississippi	16,053,000	54	5,661,000	35
Louisiana	8,837,000	30	3,484,000	39

If consideration is given to the counties in Arkansas and Mississippi and the parishes of Louisiana which border on the Mississippi or are directly affected by its floods it is found that the value of agricultural lands and buildings in 1925 was \$335,664,000, and the value of crops in 1924 was well over \$100,000,000.

The latest published statistics of the Census Bureau which include taxes imposed by levee districts are for 1922. The taxes assessed by levee districts are included by the Census Bureau in those for "specified civil divisions." All taxes assessed in 1922 were:

	Arkansas	Mississippi	Louisiana
State	\$6,444,000	\$9,080,000	\$16,701,000
Counties	5,717,000	8,876,000	10,377,000
Incorporated Places	2,031,000	6,946,000	17,456,000
Specified Civil Divisions ...	10,621,000	12,691,000	9,043,000
	\$24,813,000	\$37,593,000	\$53,577,000

The "specified civil divisions" and the amounts of taxes assessed in 1922 were:

	Arkansas	Mississippi	Louisiana
School Districts	\$6,280,000	\$2,544,000	\$2,457,000
Drainage Districts	1,164,000	1,381,000	992,000
Levee Districts	312,000	2,089,000	3,057,000
Road Districts	2,329,000	6,677,000	2,500,000

All state and local taxes were per capita in 1922:

Arkansas	\$13.87	Kentucky	\$19.40
Mississippi	20.99	Massachusetts	53.63
Louisiana	29.20	Missouri	29.01
Alabama	12.68	Montana	45.06
California	59.96	New York	57.55
Colorado	50.22	Ohio	45.64
Florida	35.22	Pennsylvania	34.04
Georgia	14.39	Tennessee	18.46
Illinois	40.76	Texas	22.76
Iowa	52.50		

The debt in 1922 was:

	Arkansas	Mississippi	Louisiana
State	\$2,722,000	\$14,864,000	\$14,829,000
Counties	4,680,000	9,836,000	19,943,000
Incorporated Places	3,065,000	22,878,000	61,205,000
Other Civil Divisions	80,813,000	63,921,000	30,969,000
	\$91,280,000	\$111,499,000	\$126,946,000

For 1926 statistics are available through the Census Bureau only as to state debts. They showed net debts at the end of the year of \$3,116,000 for Arkansas, \$16,566,000 for Mississippi, and \$14,687,000 for Louisiana. In 1926 the revenue receipts of all of these three states were more than sufficient to pay all of their governmental-cost payments, including their outlays for the building of roads.

The debt per capita for all the forty-eight states and their subdivisions was \$79.90 in 1922. For Arkansas it was \$51.03, for Mississippi \$62.27, and for Louisiana \$69.18.

The debt by the kinds of districts was in 1922:

	Arkansas	Mississippi	Louisiana
School Districts	\$4,275,000	\$3,754,000	\$5,998,000
Drainage Districts	15,057,000	12,425,000	4,658,000
Levee Districts	7,830,000	7,535,000	10,551,000
Road Districts	48,441,000	41,411,000	9,606,000
All Other	5,322,000		250,000

Upon the data set out above it can be fairly argued that control of the flood waters in the lower Mississippi is primarily a reclamation problem, and that the lands reclaimed will be so benefited, and will be so enhanced in value, that they should be assessed with at least a part of the cost of the project; at least a very substantial part of the protection to be obtained is against floods originating in the lower Mississippi valley itself. The present condition of the land might be a reason for postponing the time of payment of their part of the cost, but when the benefits have been actually realized payment by reasonable installments would not constitute an undue burden. It would seem even more clear that the cost of maintaining the works of protection should be borne by the benefited lands and communities.

Failure of the works which were constructed before 1927 to give protection from flood was not due to lack of money or to lack of centralized authority.

Since 1927 the federal government has appropriated approximately \$85,000,000 for use by the Mississippi River Commission in the lower Mississippi valley. There is statutory authorization for appropriation of \$20,000,000 more, for the period which will end with June 30, 1930. In December, 1926, a representative of the commission testified before the House Committee on Appropriations that the funds for levees from these appropriations to

1930 would, if the local interests did their part, complete the main levee line in accordance with the commission's plans. Testifying in 1922 before the same committee, the Chief of Engineers said that the levee system, which was to contain about 500,000,000 cubic yards of material when completed, was then completed to the extent of 76.5 per cent. According to the published reports of the Chief of Engineers and the Mississippi River Commission there was placed in levees between the date of this testimony and July, 1926,—*i.e.*, before the flood of 1927 occurred—more than enough material to make the main levee line complete in accordance with the commission's specifications.

The Mississippi River Commission was created by Congress in 1879 and directed to "take into consideration and mature such plan or plans and estimates as will correct, permanently locate, and deepen the channel and protect the banks of the Mississippi river; prevent destructive floods; promote and facilitate commerce, trade, and the postal service." The plan recommended by the commission, and for which Congress began appropriations in 1882, contemplates a main line of levees extending 1,800 miles, from Rock Island to the gulf and protecting 27,303 square miles, the levees always to be up to the standard and grade fixed by the commission. The commission's specifications now require that the levee must be built at least 3 feet above the highest known flood, with a top 8 feet wide, and a slope of 3 to 1, both front and rear. Thus, the standard levee is 26 feet thick at the high-water level. Moreover, in order that water may not saturate through the levee to the rear slope, causing seepage which will carry away material and make an opening, a banquettes is added in the rear.

Since flood-control works have a very large relation to river improvement for purposes of navigation, the commission's activities in building levees, which began in 1882, were formerly financed through appropriations

for rivers-and-harbors works. The federal money appropriated since the Flood Control Act was passed, in 1917, could be used for dredging the channel, for revetting caving banks or for constructing levees. So far as it was used for the first two purposes, no contributions are required from local sources. Before federal money might be used to build and repair levees, however, the law stipulated that local interests which would be protected must make a contribution toward the cost in an amount decided by the commission to be just and equitable but in no case to be less than half the amount of federal money to be spent. Moreover, the law forbade the expenditure of federal money for rights of way for levees. The consequence is that the local boards have been providing the rights of way, have been meeting one-third of the cost of construction, and have been providing maintenance. Under this plan, members of the commission have testified, local interests usually have been offering more money for construction than the commission could match with its two-thirds. The annual appropriations of federal money under the law of 1923 like the appropriations under the law of 1917 cover all of the activities of the commission. Thus, out of the \$10,000,000 available for the year ended with June, 1926, there was spent upon levees the sum of \$3,650,000. For expenditure upon levees during the same period the local contributions amounted to \$1,922,000.

BRIEF EXCERPTS

Only overwhelming importance should warrant adding to the federal power.—*Harry P. Judson. Our Federal Republic. p. 121.*

Private property should not be promoted or enhanced in value purely at the cost of the federal government.—*George S. Knapp. House Hearings. 1928. p. 931.*

I think the relation of cost to benefit should be proportioned. It has been done regularly in the drainage district work.—*George S. Knapp. House Hearings. 1928. p. 635.*

If the property owners were charged in part with the expense of keeping the levees up, they might take some interest in looking after them.—*Luther A. Johnson. House Hearings. 1928. p. 631.*

If the state's consent is necessary, it might withhold it; and if any state withholds it, you would have broken a link in your defense which would be fatal to your program.—*Philip D. Swing. House Hearings. 1927. p. 1124.*

Would you want the [federal] government to go into Kansas and put levees there where the government thought they ought to be, without regard to what your state ideas might be?—*Frank R. Reid. House Hearings. 1928. p. 630.*

The federal government within its proper sphere has already more to do than it can well accomplish. Both the Executive and Congress are overburdened.—*Everett P. Wheeler. American Bar Association Journal. 10:713. October, 1924.*

It is essential in the life of our dual government that the power and functions of the state governments be maintained in all the fulness that they were intended to have by the framers of the Constitution.—*William H. Taft. Popular Government. p. 151.*

The Mississippi river flood control bill, which President Coolidge estimates may cost the country \$1,500,000,000, was put through Congress by a pork barrel conspiracy and log rolling manipulation unparalleled in the annals of treasury lootings.—*Chicago Tribune. May 2, 1928.*

Instances are numerous where Congress has made laws for the accomplishment of ends for which the several states might have appropriately made provision. Unless a halt is soon called state legislation will be completely shorn of important jurisdiction.—*Leslie M. Shaw. Current Issues. p. 9-11.*

Home rule is the most important issue before the people. This country is too big to be governed entirely from Washington by commissions and federal officials. The people will lose their political instincts if local matters are vested by the Constitution in the federal power.—*Philadelphia Record. July 10, 1924.*

The only thing the federal government is going to have is the exclusive right to pay, the question of having the exclusive right to determine where those works are to be located to produce the greatest efficiency for the largest number of people may rest partly in the states.—*Philip D. Swing. House Hearings. 1927. p. 1126.*

This unnecessary increase of federal power and this failure of the states to assert their rights is resulting in dangerous centralization, in the breakdown of political fibre, and in the upbuilding of an unworkable and intolerable federal bureaucracy.—*Albert C. Ritchie, Governor of Maryland. Address at the Boston City Club. 1926. p. 14.*

Is there any demand for a surrender by the states of the powers reserved to them? On the contrary, every reason which existed one hundred eighteen years ago exists now, and those reasons are even stronger than they formerly were, because of the increase in the area and population of the nation.—*William J. Bryan. Reader. 9:353. March 19, 1907.*

If the government has the power to condemn lands, build spillways and construct levees without authorization from the states, if the government has the naked

right to wholly disregard the wishes of the state, ought it to do it? I do not think so. I do not think that the local community's rights and interests ought to be trampled upon by the federal government without consulting them.—*T. H. Caraway. House Hearings. 1927. p. 1124.*

Without doubt, I think that is the most serious question you will have to deal with. I do not know whether there is an inherent power in the federal government (and I am inclined to doubt it) to say that we are going to move this levee five miles back here, and that we are going to run that spillway here and change the whole course of the river. I do not think there is any inherent power in the government to do those things.—*T. H. Caraway. House Hearings. 1927. p. 1126.*

The states are the sheet anchors of our institutions. No plan of centralization has ever been adopted which did not result in bureaucracy, tyranny, inflexibility, reaction and decline. Of all forms of government, those administered by bureaus are about the least satisfactory to an enlightened and progressive people. Being irresponsible they become autocratic, and being autocratic they resist all development. Unless bureaucracy is constantly resisted it breaks down representative government and overwhelms democracy.—*Calvin Coolidge. Address at the College of William and Mary. May 15, 1926. p. 7.*

Before giving assent to proposals, excellent in purpose, to put a stop to child labor, to improve the public schools, or to aid in bringing about happier and more satisfactory social conditions, whether in the city or on the farm, the question should be asked whether the method proposed is wise and American or unwise and revolutionary. The overturn of our form of government and the substitution of an imperial democratic for a federal republic would be a sorry outcome of efforts

to aid children and women and the less fortunate elements of our citizenship.—*Nicholas Murray Butler. The Faith of a Liberal. p. 207.*

It is a curious development of our political history that a fighting faith in the rights of the states should now show more signs of revival in the north than in the south. It is understandable that the western states that came in as territories should be late in developing the old time state consciousness and state pride; but it is passing strange that the old south which gave us our Bill of Rights and where state pride and the sacredness of state rights in our earlier days attained their maximum, should now become indifferent.—*Albert C. Ritchie, Governor of Maryland. Addresses delivered at the general sessions of the Institute of Public Affairs at the University of Virginia. 1927. p. 91.*

When we commence talking of the Mississippi as a national obligation, we are talking the same kind of figures we use when we talk about war. It is not a question of millions to make the valley "safe for all time." It is a matter of billions, and then we are not too sure of what we will get. Maybe the census of destruction will show that billions are warranted to prevent another flood, maybe the time has come when the nation as a whole must take responsibility for every water course and every water source, but let us not be driven by hysteria onto such a road without trying to see whither it leads. History may be made in the Mississippi flood legislation now apparently so imminent, history that will affect all of our future power production, waterway transportation and reclamation policies.—*Editorial. Engineering News-Record. 98:931. June 9, 1927.*

Nationalism, if unchecked, will destroy the nation. The signs of danger are all around us. The national machinery groans under its over-load. National courts,

executive agencies, legislative bodies, all bear witness to their own impaired efficiency and all cry aloud for relief. The lessened interest and energy of the states in the solution of their own political problems and the habit of handing their tasks over to the national government, with the weary gesture of the very sick and the very weak, is directly due to the hypodermic of the new nationalism, which has anesthetized the states in order to take from them their rightful functions one by one. Our over-crowded, routine-ridden, bewildered national capital and our idle, pouting, irresponsible state capitals are concrete examples of nationalism run to seed.—*Rhodes S. Baker. Proceedings of the Fortieth Annual Session of the Texas State Bar Association. 1921. p. 221.*

Congress should lead the way in the enactment of legislation in which the several states affected should join, so that the federal government and the various state governments and local communities could cooperate in this great constructive improvement. The policy should be permanent and definite to insure the confidence of all that it will not be abandoned but energetically carried through to a successful completion.

To the extent that expenditures are made in aid of navigation, including dredging, snagging, revetment work, reforestation, flood control and the building of reservoirs, that should be regarded as a national problem and borne by the federal government, with the municipalities, drainage districts, local communities and individuals either contributing their equitable share toward expenditures for irrigation, water power and other benefits by municipalities or individuals for local or personal purposes, or compensating the government to the extent of the benefits derived. If a conflict of jurisdiction should arise between any state and the federal government over non-navigable tributaries, an amicable adjust-

ment can be negotiated and ratified by state and federal enactments.—*William W. Hastings. Congressional Record*. 62:280. (current file). December 8, 1927.

More and more the federal government is taking over the powers of the state, and our nation is in a headlong rush to centralize all government at Washington. This is, indeed, a dangerous tendency, and we should guard against every attempt at such centralization. The federal government proceeds in various ways to acquire this centralization. In some cases under the pretense of regulating interstate commerce, and in other cases under pretense of establishing post offices and postal routes, and in still other cases by a species of bribery. The state is helpless against the first two methods mentioned. The third method need not succeed unless the state gives its consent. The species of bribery to which I refer consists of legislation by the federal government in making an appropriation for some purpose, under conditions that the state meet that appropriation with a like amount. Sometimes the objects to be accomplished are in the interests of humanity and for a better security of the nation, while in other cases the object sought to be accomplished is to coerce the less progressive states into adopting certain legislation. Some of the purposes are, no doubt, desirable, but to my mind, in many cases the state might better afford to enter upon the same undertaking independently, and by foregoing the appropriation made by the federal government, actually carry out the same project more economically.—*John J. Blaine, Governor of Wisconsin. Message to the Legislature. January 13, 1921. p. 33-4.*

Every time the states abdicate one of their powers, or yield to the cry of some militant minority for nationwide action, a new bureau is born and a new regiment added to the army of tax-fed office holders. These bureaus with their heads, their field agents, their federal

Dogberries, their self-appointed experts, their inspectors, spies, bullies, snoopers and agents provocateur, look upon the states as mere geographical and departmental divisions. Let this thing go on and presently the states will be mere hollow shells. At every session of Congress these efficient bureaus battle and lobby bravely not only for a bigger slice of the taxpayer's money, but for more power. Steadily they become more intrusive, more dictatorial, more contemptuous of the states as states. I cite this bureaucratic phase as only one of the annoying evils arising from a failure of the states to assert their rights and the strength inherent in those rights. The real evils lie far deeper. No one questions that the federal government must of necessity and in the interest of good and efficient government, exercise both its express and its implied powers to an extent that must constantly increase; but we must keep on seeing our federal system as a whole and for what it is and what it was intended to be. If the states don't combat this excessive centralization, if the people don't work towards decentralization, then the states are bound to become steadily weaker, and democracy will grow weaker with them.—*Albert C. Ritchie, Governor of Maryland. Addresses delivered at the general sessions of the Institute of Public Affairs at the University of Virginia. 1927. p. 91.*

The beauty of saddling all the expense of sectional or local improvements on the federal government from the viewpoint of the "poor relation" states, is that those who get most of the benefit pay the least of the cost and vice versa. The scheme to spend perhaps \$1,500,000,000 more from the federal treasury in further attempts to keep the Mississippi river from rising in rainy seasons illustrates the idea perfectly. Louisiana, Mississippi, Arkansas and Tennessee are the states farthest down the big river and presumably would profit most

from the expenditure of government billions for land, labor and materials, if not from any perceptible diminution of floods. New York, for example, would not benefit at all. Yet New York would have to pay \$44 of the cost to every dollar paid by Louisiana. At least the Atlantic coast state paid \$755,079,237 in income, revenue and other federal taxes in the last fiscal year, when the Mississippi river state paid only \$17,478,975. Ohioans may be interested in knowing that the flood-control spending, of no palpable benefit to them, will cost their state some forty-three times as much as it costs Mississippi. The latter state contributed but \$3,460,085 toward paying United States bills in the same fiscal year, while \$147,430,942 was being collected in Ohio. Tennessee paid \$17,811,879 and Arkansas only \$205,487, while Michigan had to pay \$197,998,109 and Pennsylvania \$258,763,804. So the two states profiting by flood control in one way or another would get off nearly twelve or more than a thousand times easier, respectively, than the two states not benefited in the least.—*Editorial. Cleveland News. May 5, 1928.*

Under the present law the land adjacent to the dikes has paid one-third of the cost of their construction. This has been a most extraordinary concession from the plan adopted in relation to irrigation, where the general rule has been that the land benefited should bear the entire expense. It is true, of course, that the troublesome waters do not originate on the land to be reclaimed, but it is also true that such waters have a right of way through that section of the country and the land there is charged with that easement. It is the land of this region that is to be benefited. To say that it is unable to bear any expense of reclamation is the same thing as saying that it is not worth reclaiming. Because of expenses incurred and charges already held against this land, it seems probable that some revision will have to

be made concerning the proportion of cost which it should bear. But it is extremely important that it should pay enough so that those requesting improvements will be charged with some responsibility for their cost, and the neighborhood where works are constructed have a pecuniary interest in preventing waste and extravagance and securing a wise and economical expenditure of public funds.

Legislation by this Congress should be confined to our principal and most pressing problem, the lower Mississippi, considering tributaries only so far as they materially affect the main flood problem. A definite federal program relating to our waterways was proposed when the last Congress authorized a comprehensive survey of all the important streams of the country in order to provide for their improvement, including flood control, navigation, power and irrigation. Other legislation should wait pending a report on this survey. The recognized needs of the Mississippi should not be made a vehicle for carrying other projects. All proposals for development should stand on their merits. Any other method would result in ill-advised conclusions, great waste of money and instead of promoting would delay the orderly and certain utilization of our water resources. —*President Coolidge. Message to Congress. December 6, 1927. p. 12-13.*

There is submitted herewith a letter from the Hon. Dwight F. Davis, Secretary of War, transmitting with favorable recommendation the report of Maj. Gen. Edgar Jadwin, Chief of Engineers, containing the plan of the Army Engineers for flood control of the Mississippi river in its alluvial valley. The total cost of the recommended project is \$296,400,000, distributed over a period of ten years. This large sum is manifestly justified by the necessities of the situation and the benefits that will result. In determining the distribution of the

costs, there must be considered not only the people of the valley itself, who receive the major portion of the benefits, but also the great mass of taxpayers who suffer less directly from Mississippi river floods and upon whom most of the burden of federal taxation falls. It is axiomatic that states and other local authorities should supply all land and assume all pecuniary responsibility for damages that may result from the execution of the project. It would be revolutionary for the federal government to establish the precedent of buying part of the land upon which to build protective works to increase the value of the remainder. Similarly it would be very unwise for the United States in generously helping a section of the country to render itself liable for consequential damages. The federal treasury should bear the portion of the cost of engineering structures for flood control that is justified by the national aspects of the problem and the national benefits. It may even bear 80 per cent of such costs, but substantial local co-operation is essential to avoid waste. The portion this would leave to be borne locally for flood-control structures represents an expenditure of about \$3 or 30 cents per year for ten years for each acre in the alluvial valley to be protected every year from Mississippi river floods. The value per acre including railroads, towns, cities and other improvements, is estimated at something over \$200. It would seem that the states should share with the federal government the burden of assisting the levee districts and individual property owners, especially in view of the fact that the states benefit directly by the increased taxes from land made more valuable by reason of its protection.—*President Coolidge. Message to Congress, December 8, 1927, transmitting the Report of Maj. Gen. Edgar Jadwin, Chief of Engineers, containing the plan of the Army Engineers for flood control of the Mississippi river.*

Debaters' Handbook Series

Each volume contains a well chosen collection of reprints of arguments on both sides of the question with a brief and a carefully selected bibliography that invites one to further reading on that subject.

Compulsory Insurance. Morgan, J. E. 1912. **Protection.** Morgan, J. E. 1912.

Employment of Women. Bullock, E. D., and Johnsen, J. E. 1919. **Minimum Wage.** Reely, M. K. 1917.

Federal Control of Interstate Corporations. Phelps, E. M. 1915. **Recall, Including Judges and Decisions.** Phelps, E. M. 1915.

The Handbook Series

This series includes a number of subjects on public questions on which every man and woman should be well informed. The reprints are grouped (for convenience) according to the stand taken by the speaker quoted on the subject and an extensive bibliography guides one to further reading on the subject.

Cloth. Price \$1.25 unless otherwise quoted.

- | | |
|---|--|
| Agricultural Credit. Bullock, E. D. 1915. | Employment Management. Bloomfield, D. \$2.40. 1919. |
| Americanization. Talbot & Johnsen. \$1.80. 1920. | European War. Vol. II. Bingham, A. 1916. |
| Birth Control. Johnsen, J. E. \$2.40. 1925. | Evolution. Phelps, E. M. \$2.40. 1926. |
| Capital Punishment. Beman, L. T. \$2.40. 1925. | Fundamentalism vs. Modernism. Vanderlaan, E. C. \$2.40. 1925. |
| Child Labor. Johnsen, J. E. \$2.40. 1924. | Government Ownership of Coal Mines. Johnsen, J. E. (Slightly imperfect copies only). \$2. 1923. |
| Closed Shop. Beman, L. T. 2d ed. \$2.00. 1922. | Marriage and Divorce. Johnsen, J. E. \$2.40. 1925. |
| Commercial Arbitration. Bloomfield, D. \$2.40. 1927. | Modern Industrial Movements. Bloomfield, D. \$2.40. 1919. |
| Criminal Justice. Kirby, J. P. \$2.40. 1926. | Negro Problem. Johnsen, J. E. \$2.25. 1921. |
| Current Problems in Municipal Government. Beman, L. T. \$2.40. 1923. | Prison Reform. Bacon, C. 1917. |
| Current Problems in Taxation. Beman, L. T. \$2.25. 1921. | Problems of Labor. Bloomfield, D. \$2.40. 1920. |
| Debaters' Manual. Phelps, E. M. 5th ed. \$1.50. 1924. | Prohibition: Modification of the Volstead Law. Beman, L. T. \$2.40. 1924. |
| Disarmament. Reely, M. K. \$2.25. 1921. | |

THE

3 5132 00322 0852

University of the Pacific Library

qued

Short Ballot. Bullo

Series II.

Slavonic Nations of Yesterday and Today. Stanoyevich, M. S. \$2.40. 1925.

Social Insurance. Johnsen, J. E. \$2.40. 1922.

States Rights. Beman, L. T. 1926. \$2.40.

Study of Latin and Greek. Beman, L. T. \$1.80. 1921.

Unemployment Insurance. Forsberg, A. B. \$2.40. 1926.

War—Cause and Cure. Johnsen, J. E. \$2.40. 1926.

Vol. I. Old Age Pensions. Beman, L. T. \$2.40. 1927.

Vol. II. Federal Department of Education. Johnsen, J. E. \$2.40. 1927.

Vol. III. China, Yesterday and Today. Johnsen, J. E. \$2.40. 1928

Vol. IV. Interallied Debts and Revision of the Debt Settlements. Gerould and Turnbull. \$2.40. 1928.

Vol. V. Intervention in Latin America. Beman, L. T. \$2.40. 1928.

Abridged Debaters' Handbook Series

Collections of articles for and against the subject under discussion, with a brief and bibliography.

Paper. Price 25c each unless otherwise quoted.

Athletics. Johnsen, J. E. 35c. 1917.

Fortification of Panama Canal. Fanning, C. E. 1912.

Government Ownership of Telegraph. Phelps, E. M. 1912.

Non-Resistance. Parsons, 35c. 1916.

Panama Canal Tolls. Phelps, E. M. 1913.

University Debaters' Annuals

E. M. PHELPS, ED.

Series of year books, each a collection of representative intercollegiate debates on important questions of the day. Constructive and rebuttal speeches for both sides. Each debate is accompanied by selected bibliography and briefs.

Vol. XIII. 1926-1927. \$2.25. Ready September, 1927.

The McNary-Haugen farm relief bill; Extraterritoriality in China; Repeal of the prohibition amendment; Protection of the property of United States citizens on foreign soil; Cancellation of allied war debts; Legislative control of curricula; Governmental principles of Mussolini; Equal rights amendment.

Vol. XI. 1924-1925. \$2.25

Cabinet Form of Government; Chinese Exclusion; Uniform Marriage and Divorce Law; Participation in President's Cabinet in Foreign Control; Mencken School; Amendment of the U. S. Constitution; Labor.

Vol. XII. 1925-1926. \$2.25.

Revision of Rules of the United States Senate; Government Commission for Regulation of the Coal Industry; A Federal Department of Education; Government Restriction of Personal Liberty; Centralization of Power in the Federal Government; Popular Referendum on War; Air Service, a Separate Department of National Defense; Education the Curse of the Age; Child Labor.

Vol. X. 1923-

Legal Status of Criminals; Employment of Power of Government; of the U. S. Constitution; Labor.

